The IRON AGE

January 9, 1958 A Chilton Publication The National Metalworking Weekly

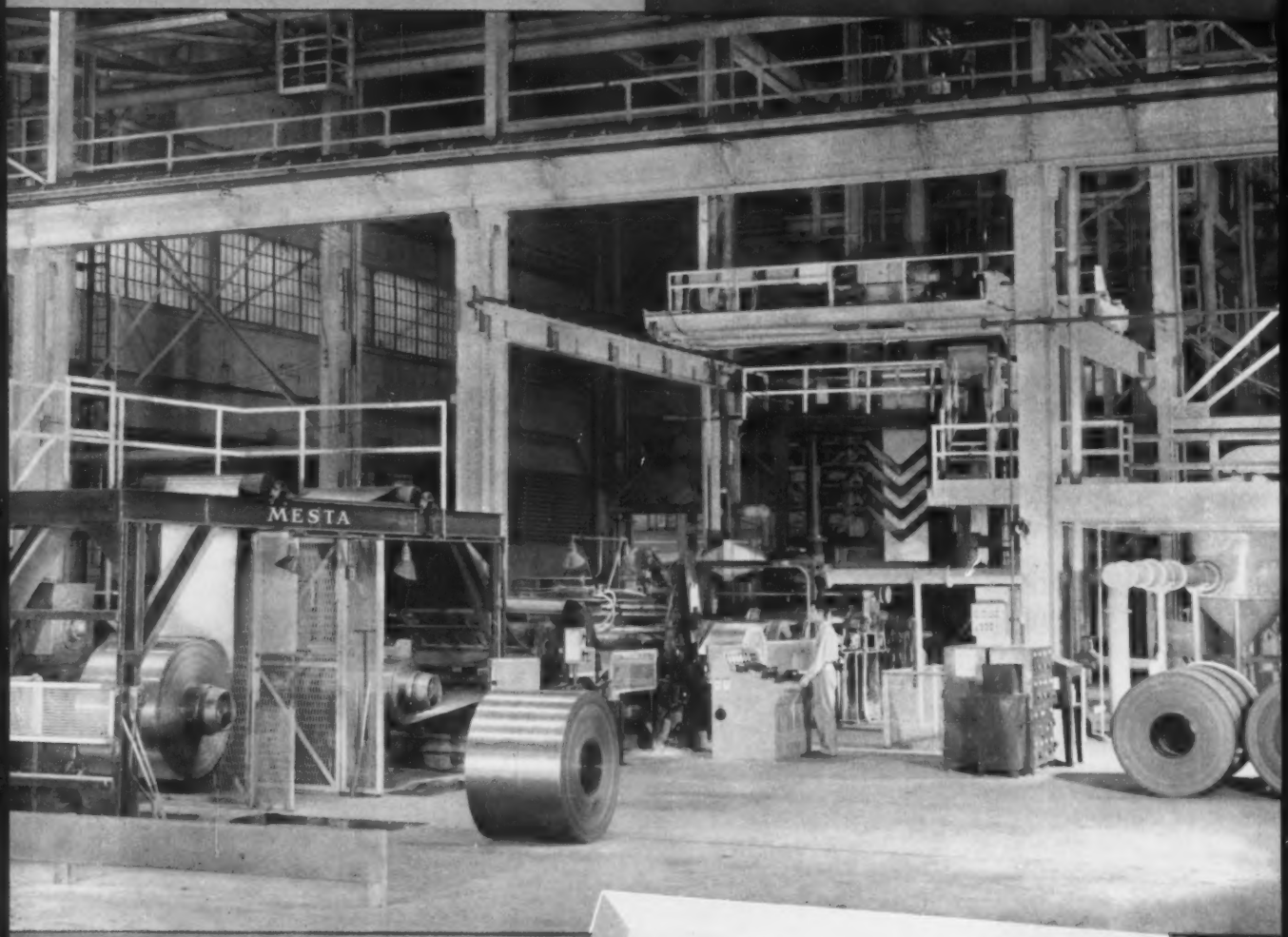
Missiles: How Big A Share For Metalworking? P. 19

Small Company Finds It Pays to Communicate – P. 24

How Good Are Leaded Steels in Fatigue? – P. 59

Digest of the Week P. 2-3

CONTINUOUS CLEANING *and* ANNEALING LINES



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High-strength bolts join framework of new office building in Newark

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Indexed in the Industrial Arts Index and the Engineering Index.

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The IRON AGE

January 9, 1958—Vol. 181, No. 2

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Improvement Pays Off — Three years ago an Ohio firm, City-Atlas,

began an all-out drive to improve its communications system. One impressive result: productivity has increased. P. 24

HYDROMETALLURGY

A Growing Market—Advances in hydrometallurgy technology have suddenly thrust this old process forward as a new growth industry. At least 19 hydro-plants are in the building or planning stage. P. 27

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Defense Dominates—Most important actions of Congress this year will involve defense problems.

Metalworking

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Defense spending will go up, taxes may also climb. Labor laws are coming. P. 41

FARWEST OPTIMISTIC

But Caution Deepens — Poll of businessmen on West Coast finds most believing first quarter activity will be better or as good as fourth quarter '57. Southern Californians are the most enthusiastic, northern Californians and Hawaiians the least. P. 43

FEATURE ARTICLES

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COAT MAGNESIUM

For Extra Protection — There's a coating system that meets the test. The new material is an air-drying thermosetting copolymer resin to which a catalyst is added just prior to use. It's a coating—that withstands the thermal shock to be expected in missile applications. P. 64

DIEING MACHINE

Key in Flexibility—In a contract stamping shop, the stress is on fast accurate work, with die setups changed in a hurry. A new 300-ton double crank, automatic dieing machine meets all these demands. Special high speed dies stand up to the press speed of 120 strokes per minute. P. 68

VACUUM-LIFT TRANSFER

Positions Heavy Plate—A traveling gantry crane with a vacuum lift not only transfers heavy work to loading stations, but takes over the job of accurately placing the load for feeding into automatic steps. P. 70

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For Lubricating Close Fits — Modern high speed machines have a problem in scoring and seizing of ferrous metal parts. A preventive solution is in a salt bath treatment that produces a case on any ferrous metal high in iron sulfide. P. 72

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Will It Hurt Market?—Despite projects for tinless and aluminum cans one tin mill sales official isn't worried. He's U. S. Steel's George Totten who sees a continued good market for his product. P. 28

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Watch for an Upswing—Builders of machine tools are eying their new order level which has remained virtually the same for three months. They hope leveling may be tip-off that the rate is going to start up again. P. 45

BRIGHT METALS BATTLE

For Automotive Market—Stainless steel and aluminum producers are waging a running battle for a larger share of the auto market. And both are winning. P. 36

SOUR NOTES

Steel Off to Slow Start—The steel market was playing a sour tune as 1958 got underway. But there's a good chance of sweeter tunes when inventory shake-down ends. P. 97

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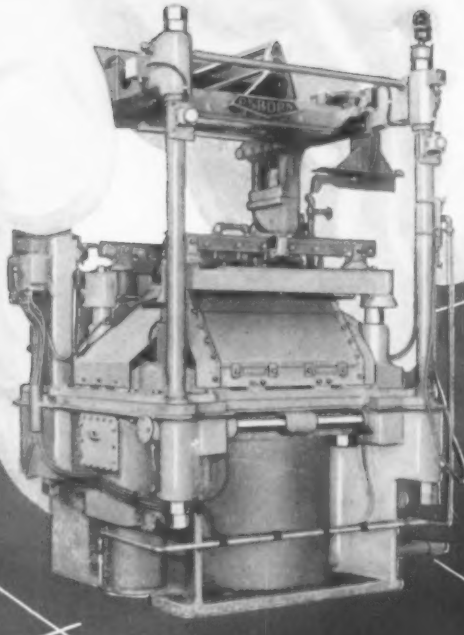
OPERATIONS RESEARCH

Promises Benefits—If your problems can be stated in figures, the chances are it'll pay you to look into next week's feature on operations research. It's a scientific method of boosting effectiveness in management decisions.

the



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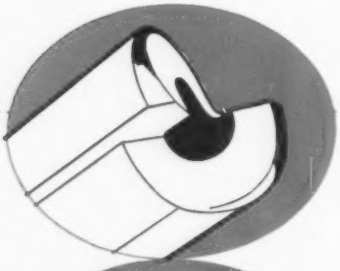

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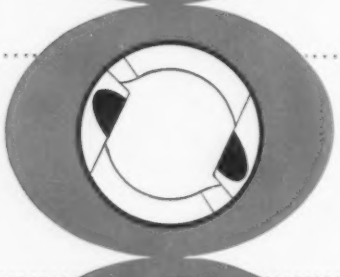
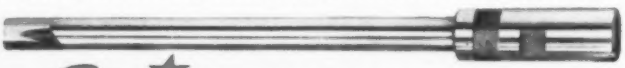
Has the exclusive trepanning action. Produces precision through-holes from the solid in cast iron, bronze, aluminum and some stainless steel parts. Two-flute carbide design.

Starbore CENTER-CUT DRILL

Produces no pin. For precision blind holes, holes that intersect cross holes, and applications where a pin is not desirable. Two-flute carbide design.





Starbore REAMER

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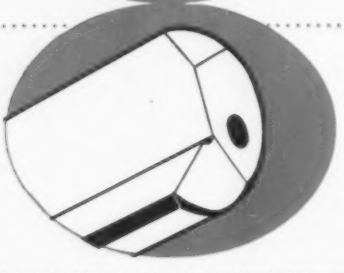
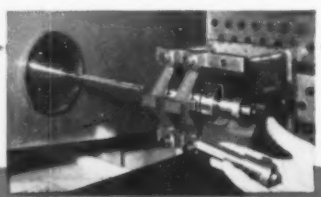


Star GUN DRILL

A gun drill of conventional design for drilling precision holes from the solid in steel. Made in sizes from 3/16-in. to 1½-in. diameter. Single flute carbide design.



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Write for this catalog file giving complete information on Starbore gun drilling tools.

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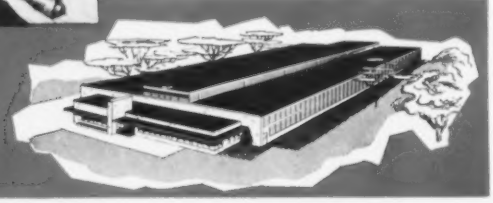

What About the Future— Is the Picture Totally Black?

There is much surface wringing of the hands over the business outlook, our military posture and unmistakable gains of the Russians. At the same time there is—among some—a suicidal tendency to be completely complacent.

The real answer is not somewhere about midpoint between both such views—not by a long shot. We are in serious trouble. We will—in time—get out of it. The American people have not lost completely their heritage despite the fall-of-Rome appearance of our culture.

Our business correction will hit bottom probably by July. The upsurge will begin shortly after Labor Day. It will gain considerable speed by the early part of 1959. So it is best to hold on, face the facts, correct excesses and eliminate ponderous mediocrity in our daily jobs. We will pull through and be stronger and wiser.

Defense-wise, it isn't that simple. At present, our government is badly strapped for cash. It can't pay all of its bills. Its headlines are brave but so far they are but ink and paper. True this will be backed up eventually by action, but it must come soon.

As usual, the man on the street is away ahead of Messrs. Eisenhower, Hagerty and Adams. It is fantastic that these men insist upon treating the public as if they were second class morons. The truth has been kept not only from Mr. Eisenhower; it has been kept from our citizens.

Now that the Gaither report has jogged Ike into facing realities, he might begin to question whether he has been getting the right dope. That might affect the minions around him who want to keep him insulated from reality.

We have a long row to hoe. The cost will frighten some unless they see the alternative. Forty billion dollars for defense is peanuts compared to what is coming in a few years. It is better that we face this now no matter what the "peace" pundits try to tell us.

The Russians are gaining on many fronts; especially the ones that spell trouble for us. They regard strength as trouble for them; weakness as their ally in grabbing off more of the world. They have done a bang-up job in intimidating our allies and producing discord.

We are behind and we need to stiffen our backbone. We must give up some of the soft and gentle treatment we lavish upon ourselves.

But the real answer: We can and we will come out on top—the hard way.

Tom Campbell

Editor-in-Chief

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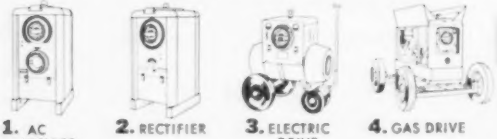

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LETTERS FROM READERS

Avalanche

Sir—Your editorial ("Mr. Eisenhower's Quandary: Only He Can Steer His Course") in the Dec. 5 IRON AGE is excellent. I agree wholeheartedly with your statement, "The country is not going to fall apart because Mr. Eisenhower has suffered a mild cerebral attack; neither is he."

Word Plague—I become very disturbed and concerned with the avalanche of words we are plagued with by most of our news commentators and politicians and fickle business men who start a wave of events that affect our whole economy as soon as our President becomes ill.

I admire Mr. Eisenhower for letting the people know about his condition. After all, we had a man who guided our ship of state from 1933 until his death, who was not in robust health when he was elected to office for his first term.

Our country has better leadership now than we have had for many years.—R. H. Larson, Vice Pres.—Mfg., Indiana Forge & Machine Co., East Chicago, Ind.

Square Hit

Sir—I have just finished reading your Dec. 12 article, "How to Plan for Lower Costs." I feel that it is a very enlightening article and "hits the nail squarely on the head."

O. D. Johannessen, AIM Steel Ltd., Vancouver, Canada.

Champion

Sir—Many business people within the 7th United States Congressional District are most grateful for the publication of the article in the Nov. 28 issue of The IRON AGE by the Hon. Clarence J. Brown on "Government in Private Business."

It is most encouraging to small businesses to see a champion such as Congressman Brown using your publication to bring to the people of America such conditions as enumerated in this article.—E. B. Kunk, Public Relations Dir., The Bauer Bros. Co., Springfield, O.

Motion Weighing

Sir—I refer to the item on p. 150 referring to weighing moving freight cars in your Nov. 21 issue.

This states inaccurately as follows: (1.) "Heretofore weighing cars while coupled and in motion has been impossible because of the transfer of weight between cars through the bound couplers which made one car weigh heavy while the other weighed light" and (2.) "Any standard scale and recording device can be used."

Patent Source — Our company has been weighing cars successfully in coupled motion for many, many years with completely satisfactory weights. This applies to both two draft and single draft weighing.

I am attaching herewith a copy of a letter I have written to the International Railroads Weighing Corp., which you will note informs them that we are the owners of patents with regard to motion weighing, which must be respected if coupled motion weighing is utilized.—V. C. Kennedy, Pres., Streeter-Amet Co., Grayslake, Ill.

"You've got to cut out hunting and fishing. Go to the city—get a job—stop relaxing!"

if you're feeling very well

or if you're feeling queerly

if it's living you want most

have a checkup yearly

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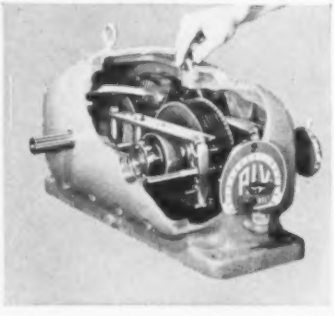
How Link-Belt P.I.V. provides stepless speed control

By employing a positive chain drive to transmit power, Link-Belt's P.I.V. (Positive, Infinitely Variable) variable speed drive provides instant and positive speed settings, with no perceptive loss of speed regardless of load. Stepless variation of any speed from maximum to minimum can be obtained instantly, even while operating at full load.

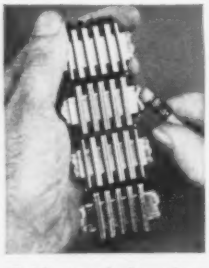
The chain which forms the "heart" of P.I.V. is a self tooth-forming chain consisting of a series of overlapping steel laminations which serve as teeth and are free to move from side to side, singly or collectively (see below). This ingenious chain fits into radially grooved wheels (see below) which have teeth cut at a constant depth but of increasing width toward wheel periphery.



P.I.V.'s are compact, permitting installation as either a separate unit or as a built-in part of the driven machinery. Exceptional application flexibility can be accomplished by incorporating both motor and helical gear sets integrally with the P.I.V. drive.

By means of pneumatic, electronic, hydraulic or mechanical controls, P.I.V.'s can be used to synchronize machine components or complete machines with a precision matched by no other method. Whether these processes involve tension, volume, synchronization, winding speeds, moisture content, product thickness or similar requirements, these controls sense variations quickly and compensate for change through the P.I.V. before product quality is affected.

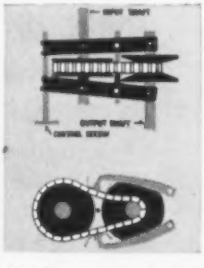
These unique P.I.V. drives are built in a wide range of sizes and assembly types, in capacities from ½ to 25 h.p.



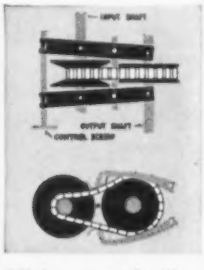
Self tooth-forming chain consists of overlapping steel laminations serving as teeth.

Teeth on radially grooved wheels provide grip for self tooth-forming chain.

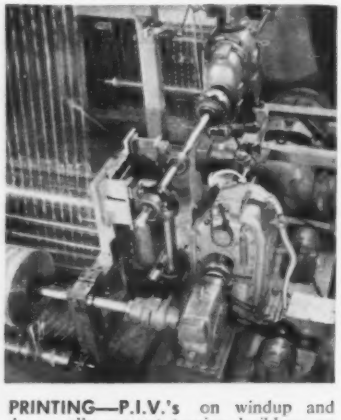
Chain teeth engage wheels to provide a positive chain drive to transmit power.



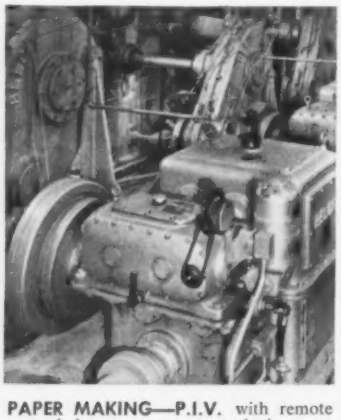
Maximum speed setting of the grooved wheels produces high speed at output shaft.



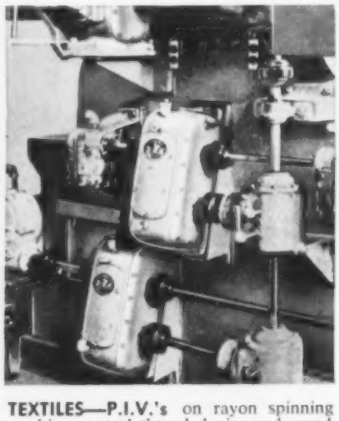
Minimum speed setting of the grooved wheels produces low speed at P.I.V. output shaft.



PRINTING—P.I.V.'s on windup and dryer rolls prevent tension build-up on press running cellophane sheet.



PAPER MAKING—P.I.V. with remote control lets operator control draw on differential drive paper machine.



TEXTILES—P.I.V.'s on rayon spinning machine control thread denier and speed of viscose metering pumps.

BOOKS 2274 and 2349 describe P.I.V. drives and controls, respectively. Get your copies from your nearby Link-Belt office or authorized stock-carrying distributor.

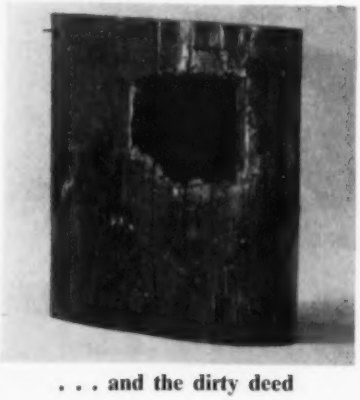
LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville (Sydney), N.S.W.; South Africa, Springs. Representatives Throughout the World. 14,310

Man Against Bird

In the Atchafalaya swamp region of Louisiana, woodpeckers were really giving engineers of Stone & Webster Engineering Corp. and Gulf States Utilities Co. the bird.

The woodpeckers, said to be the size of chickens (and even as big as turkeys according to some of the natives) had a nasty habit of chipping holes out of transmission line poles for their nests. This made

The dirty bird . . .



. . . and the dirty deed

for fine nests but rather short-lived transmission poles.

Like the Taste — New poles seemed to have an especially appealing taste to these Louisiana woodpeckers even when treated with creosote and other chemicals. In fact they liked them better treated. In some jobs Stone & Webster engineers have had to replace new poles even before they finished installing a line.

These photos show how things were when the woodpeckers were living high off the pole. But of course, they couldn't win. Their canny engineer adversaries countered with a ¼-in. galvanized steel jacket. Since then there has been a lot of beaks out of joint and a new low in woodpecker housing starts.

High Finance

After reading the year-end prognostications of stock market experts we rather appreciate this old chestnut of George Jessel's.

Seems he was tipped off to a good buy in penny Canadian mining stocks selling at five cents per share. He called his stock broker and ordered a few thousand shares. The stock began making healthy advances and at each rise George bought more.

When the stock hit twenty-five cents he figured that discretion was the better part of valor and called his broker.

"Sell my Canadian mining stock," he said.

The phone was silent for a moment. Then the broker replied, "To whom?".

Puzzlers

The answer to the old 60 mph puzzler seems to be "tain't possible." At least that's what everybody told us, including V. B. Riley, H. B. Smith Machine Co., Smithville, N. J.; Dave Newcomb, Newburyport, Mass.; ole Dick Hautzenroeder, Detroit; D. M. Ertner, Western Electric, Omaha; R. W. Leary, Leeds & Northrup Co., Philadelphia; W. C. Cropper, American Steel Band Co., Pittsburgh; A. B. Retallick, New York City; Edwin J. Montgomery, Newton, Pa.; Jim Mull, The North American Mfg. Co., Cleveland; and Leo E. Holcomb, Crawford & Doherty Foundry Co., Portland, Oregon.

Labor and time savings are a big feature of this CINCINNATI drum-type Cleaning Machine installed in the hardware division of a big-3 automobile manufacturer. Space-saving design washes both parts and media from previous tumbling and burnishing operations, then separates media automatically.

Got a new *or* old cleaning or finishing problem? CINCINNATI engineers consistently prove time savings up to 75%, labor savings up to 81%, production increases of 120% and more! Write for details.

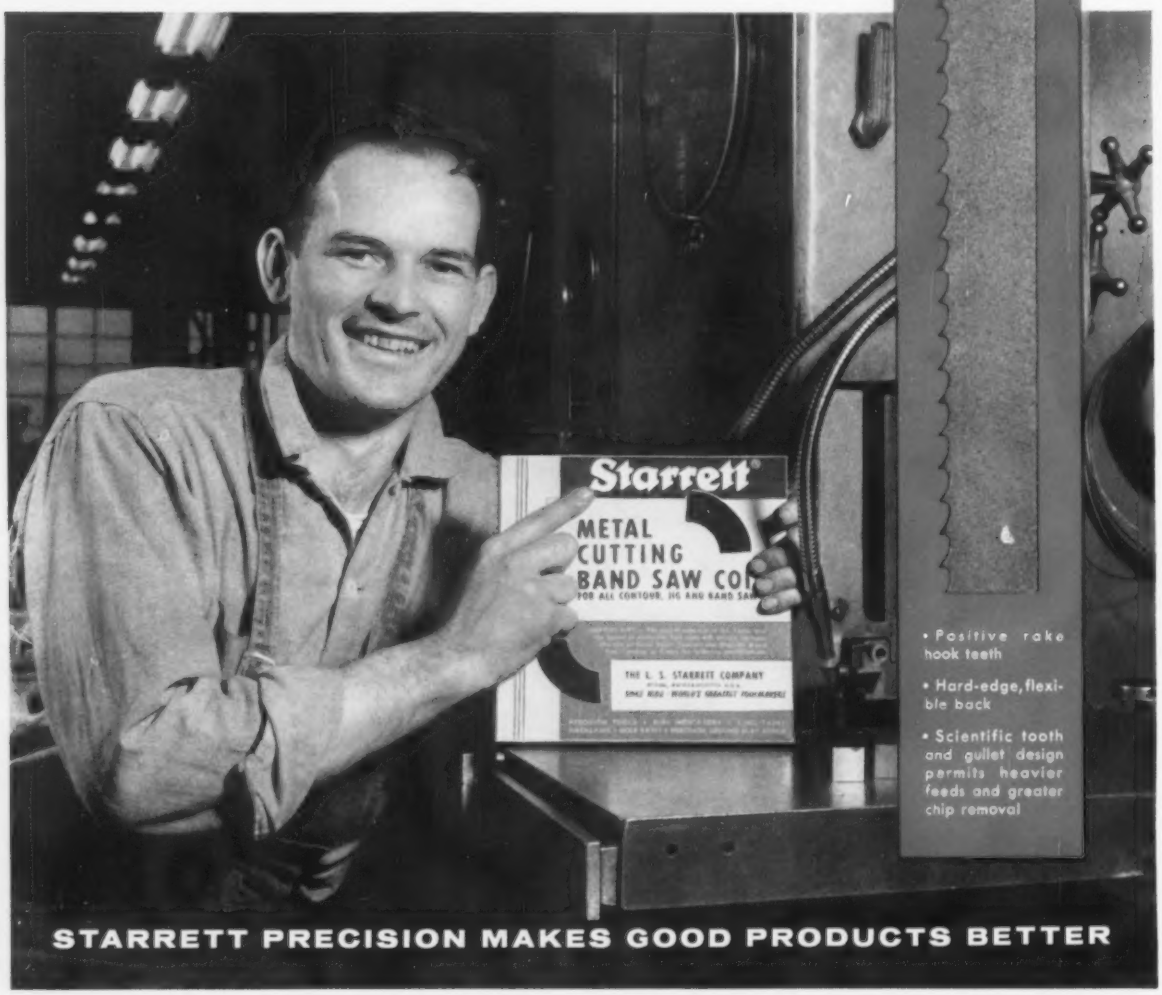
CINCINNATI CLEANING and FINISHING MACHINERY COMPANY
2017 Hageman St.,
Cincinnati 41, Ohio

New STARRETT HOOK TOOTH BAND SAW

for faster production, lower costs, longer blade life on tough jobs

This new Starrett band saw blade with positive rake hook teeth slices through non-ferrous metals, special compositions, Bakelite, plastics and wood with a cool, clean shear cut that takes less feed pressure. It defies the toughest cutting jobs — produces big, curled chips that roll smoothly out of the rounded gullets without clogging.

Try this new Starrett *Hook Tooth* Band Saw Blade. You'll find that its cool, clean cutting action and edge-holding ability gives you better work with a smoother finish at lower cost. Your nearby Industrial Supply Distributor has it in individually boxed welded bands or coils of 100, 250 or 500 feet in handy safety pull-out cartons. Call him for quality products, dependable service. Or write for Starrett Hacksaw and Band Saw Catalog. Address Dept. IA, The L. S. Starrett Company, Athol, Massachusetts, U. S. A.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METAL
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THE L. S. STARRETT COMPANY
• Positive rake hook teeth
• Hard-edge, flexible back
• Scientific tooth and gullet design permits heavier feeds and greater chip removal

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PRECISION TOOLS • DIAL INDICATORS • STEEL TAPES • GROUND FLAT STOCK • HACKSAWS • HOLE SAWS • BAND SAWS • BAND KNIVES

EXHIBITS, MEETINGS

Plant Management and Engineering Show—Jan. 27-30, 1958, International Amphitheatre, Chicago.

Packaging Machinery and Materials Show—March 25-28, Convention Hall, Atlantic City, N. J. (Hanson & Shea, Inc., One Gateway Center, Pittsburgh 22.)

JANUARY

Society of Automotive Engineers Inc.—Annual meeting, Jan. 13-17, Hotels Sheraton-Cadillac and Statler, Detroit. Society headquarters, 485 Lexington Ave., New York 17.

Malleable Founders' Society—Semi-annual meeting, Jan. 17, Hotel Cleveland, Cleveland. Society headquarters, 1800 Union Commerce Bldg., Cleveland.

Institute of Scrap Iron & Steel Inc.—Annual meeting, Jan. 19-22, Eden Roc, Fountainbleau, and Deauville Hotels, Miami Beach, Fla. Society headquarters, 1729 "H" St., N. W., Washington 6, D. C.

Truck Trailer Manufacturers Assn.—Annual meeting, Jan. 20-22, Palm Beach Biltmore Hotel, Palm Beach, Fla. Society headquarters, 710 Albee Bldg., Washington 5, D. C.

American Road Builders' Assn.—Annual meeting, Jan. 20-23, Sheraton-Park Hotel, Washington. Society headquarters, 600 World Center Bldg., Washington 6, D. C.

American Institute of Electrical Engineers — Winter meeting, Jan. 20-24, Hotel Statler, New York. Society headquarters, 33 West 39th St., New York 18.

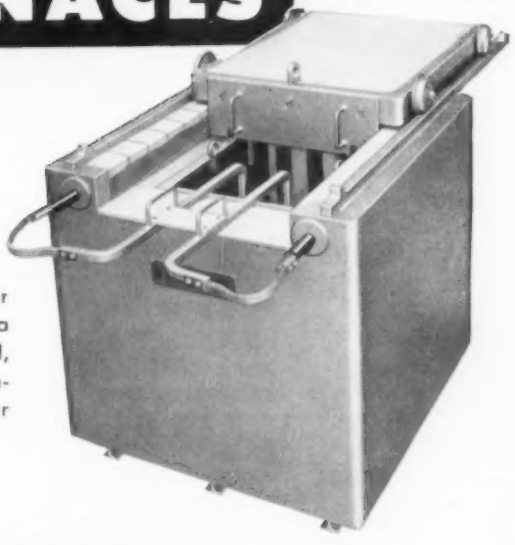
Steel Shipping Containers Institute Inc.—Winter meeting, Jan. 21-22, St. Regis Hotel, New York. Society headquarters, 600 Fifth Ave., New York 20.

HEVI-DUTY SALT BATH FURNACES

WITH IMMERSED ELECTRODES

Temperatures from 300° F. to 2400° F.

Built to any size or capacity with either a ceramic, welded steel, or alloy pot whichever the particular process requires.



SPECIAL FEATURES of the HEVI-DUTY FURNACES

- Immersed alloy electrodes with water-cooled terminals which prevents the conduction of heat to the transformer.
- Self-contained ceramic pot quickly removable. Ceramic, steel, or alloy pots are interchangeable—thus one furnace can be used for a variety of operations by merely changing to the pot best suited for the process.
- Electric starting coil quickly remelts the salt after a shut-down.
- Recessed electrodes permit a rolling cover, thus minimizing heat radiation from the bath surface.
- Low operating voltage eliminates shock danger.

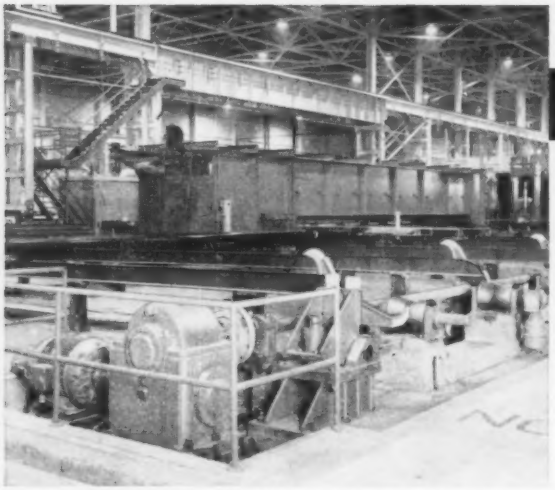
Send for Bulletin 655. It describes the other advantages of Hevi-Duty Salt Bath Furnaces.

HEVI-DUTY ELECTRIC COMPANY

MILWAUKEE 1, WISCONSIN

Heat Treating Furnaces... Electric Exclusively

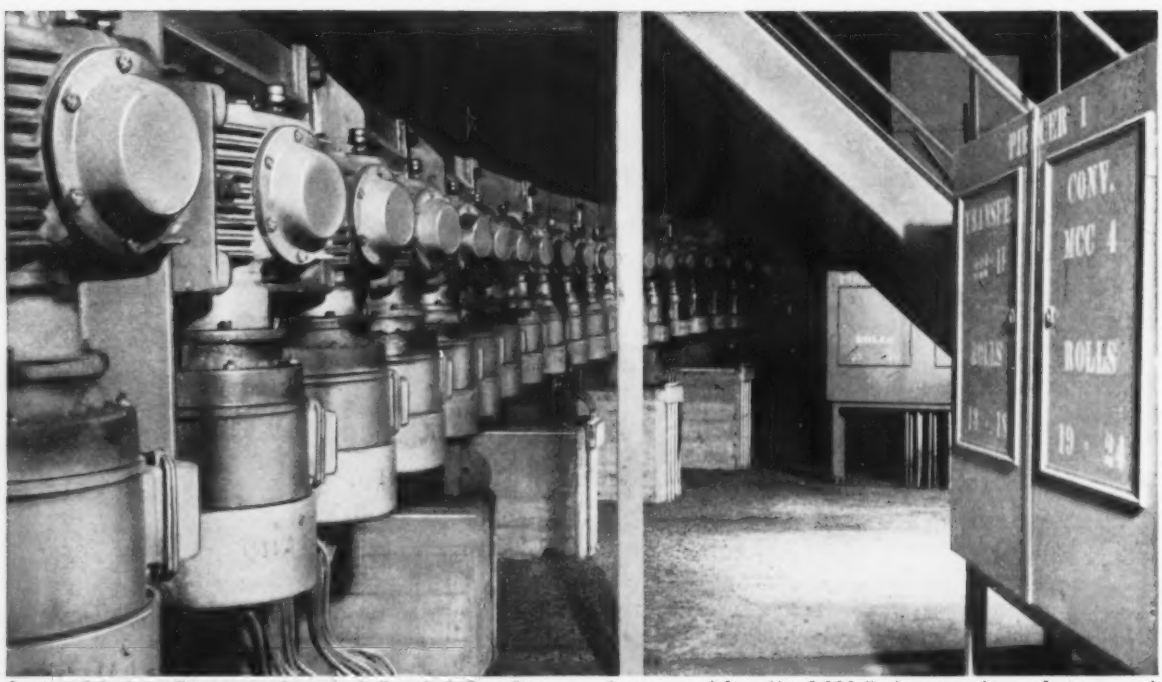
Dry Type Transformers · *Constant Current Regulators*



Over 70 Star Wheel transfer drives are the roughest applications in the Mannesmann Tube mill. The Star Wheel shown picks up the heavy tube and transfers it to the transfer skids in one second's time with ⅓ of a revolution of the gearshaft of the Cone-Drive 12-inch center distance worm-under speed reducer. Reducer is driven by a 25-hp high-torque motor.

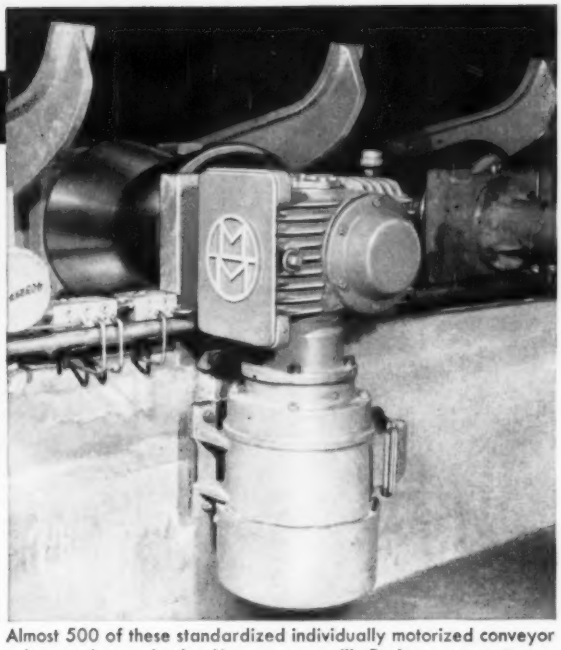
Plug mill is adjustable to handle diameters from 4½ to 10¾ inch finished OD. Adjustment is made by moving wedges coupled to an Acme threaded shaft driven by a hollow shaft 7-inch center distance Cone-Drive reducer. Power is supplied by 15-hp, 900 rpm high-torque reversing electric motor. Reduction is 40:1. Housing is only one in mill not made of ductile iron.

New MANNESMANN TUBE MILL makes extensive use of double-



Section of the hot mill conveyor, driven by hollow shaft Cone-Drive reducers, that takes bars from furnace to first piercing mill. Conveyor knocks scale from bars while turning corner and raising bars several feet. Hot 3,000 lb. bars travel at a fast rate and service is severe. Motorized reducers have 5:1 reduction. Motor base loosely coupled to stand acts as torque arm.

A 6-inch tube is shown here on a transfer skid between the cut-off machine and the longest conveyor in the Mannesmann mill—the main cold mill conveyor. Each roll on the conveyor, stretching as far as the eye can see, is driven with a motorized hollow shaft Cone-Drive double-enveloping worm gear reducer.



Almost 500 of these standardized individually motorized conveyor units are in use in the Mannesmann mill. Basic components are standard 3-inch center distance Cone-Drive hollow shaft speed reducer and 1½ hp electric motor. This drive is on the conveyor that takes cold bars from the burning machines to the furnace.

enveloping worm gear reducers

Mannesmann's new 20-million-dollar tube mill at Sault Ste. Marie, Canada uses 600 standard Cone-Drive speed reducers in its drives

Reflecting the latest in design and equipment, the new Mannesmann Tube Company, Ltd. seamless steel tube mill at the Canadian Soo will produce almost a quarter-million tons of tubing annually. It is the most completely automated tube mill in existence today and can truly be called a "push-button" production plant. The quarter-mile long plant will require an operating force of 500 men, most of them engaged in maintenance activities.

To keep maintenance to a minimum, Mannesmann selected and designed the most rugged equipment possible. One outstanding example is found in their use of Cone-Drive double-enveloping worm gearing in their drive systems. Cone-Drive speed reducers were selected because of their high load-carrying capacity, maximum operating life and minimum service trouble. Experience since the opening of the mill has justified this decision with no operating trouble being reported on the reducers.

With the exception of one unit, all of the 600 Cone-Drive speed reducers used are standard models with ductile iron housings. Capacities range from one to 60 horsepower. Almost every reducer is operating under some form of severe shock loading and this was another important consideration in their selection by Mannesmann engineers.

CONE-DRIVE GEARS DIVISION MICHIGAN TOOL COMPANY

7171 E. McNichols Road • Detroit 12, Michigan • Telephone: TWinbrook 1-3111

DOUBLE-ENVELOPING WORM GEARSETS

DOUBLE-ENVELOPING WORM GEAR SPEED REDUCERS

DOUBLE REDUCTION WORM GEAR SPEED REDUCERS

DOUBLE-ENVELOPING RIGHT ANGLE GEARMOTORS

ND FACTS

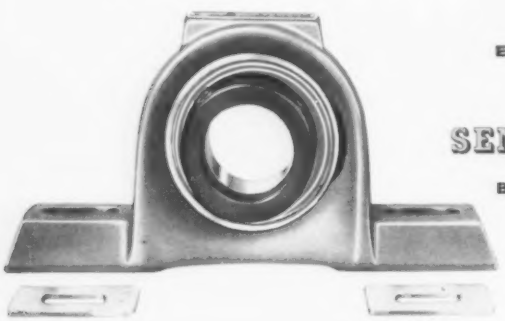
NEW DEPARTURE PILLOW BLOCKS— BUILT FOR LOWEST MAINTENANCE

- New Departure adapter ball bearings are sealed and lubricated for life.
- Design is compact and rigid—fits easily in limited space.
- No grease nipples or other protruding lubricating fixtures needed.
- Pillow blocks are easily mounted without need for any special tools.
- New Departure ball bearings are high capacity, precision-built for long life.
- Bearing and block surfaces are spherical to accommodate any misalignment.
- Thirty-two shaft sizes, $\frac{1}{2}$" through $2\frac{15}{16}$", for wide variety of applications.
- Interchangeable with most other makes of pillow blocks.

Bearings are easily applied to shafting and are positively locked in position with eccentric cam locking collar and set screw.

Elongated bolt holes designed to accommodate practically every type of spacing for hold-down bolts.

Mounting pads are furnished with each New Departure Pillow Block to assure easy interchangeability with all pillow blocks having a high base-to-center dimension.



EQUIPPED WITH

BALL BEARINGS

New Departure Pillow Blocks employ performance-proved Type AE adapter ball bearing with Sentri-Seals for long-life protection against dirt or grease leakage.

Send for Catalog PBC

1908–1958 GM FORWARD FROM FIFTY

ND NEW DEPARTURE

DIVISION OF GENERAL MOTORS, BRISTOL, CONN.

NOTHING ROLLS LIKE A BALL

Delay Shelter Program

A proposed multi-billion-dollar Government air raid shelter program won't be started in the new fiscal year. Cost of the program, anywhere from $3 to $30 billion in five years, is the main reason. Its frightening impact on many people is another factor. Several recent reports on relative Russian and U. S. strength grimly urge shelters, but the Administration isn't buying the idea now.

Skip Titanium Sponge

A top titanium research man gives the green light to a continuous electrolytic process to produce the metal from titanium dioxide. Since the new technique eliminates the sponge phase of production, he feels that it's well worth pushing as a commercial venture.

Make Stronger Fasteners

There's promise of better fatigue strength for fasteners in high temperature applications. Long-term research in this area seems to be nearing its goal. The problem has been one of the road-blocks in the development and production of better missiles. Part of the solution lies in taking advantage of interference fits.

Big Year for Electricity

Makers of heavy electric power generating equipment are strongly optimistic for 1958. As the new year gets underway, plans call for setting a new high in generating capacity. If all goes well, new installations over the next 12 months will be almost 25 pct ahead of the previous record year.

Army Views Triple Threat

Army plans for the future call for instant readiness to meet three possible military situations: cold war, limited war, and general atomic war. By 1962, the Army will be using greater quantities of missiles and rockets, its own aircraft, lightweight armored vehicles, and complex electronic equipment. Atomic weapons, irradiated and dehydrated foods, and compression-ignition engines will, by 1962, drastically reduce the problem of delivering tonnages of ammunition, food and gasoline.

Machine For 3-D Drawings

A new drafting machine promises to simplify the tough job of producing those increasingly popular three dimensional drawings. It makes them in true perspective and offers a choice of scales and view angles. The machine needs only a plan and an elevation drawing and a draftsman of moderate ability to do these jobs in ⅓ to 1/7 of the time now required, it's said.

Cargo Plane Boom

Talk of glamorous new passenger planes almost obscures the fact that airlines are building up their cargo fleets at a fast clip. Purchases by one major line this year alone will boost its roster of cargo craft by 40 pct. The line's freight business was 14 pct better last year than it was in 1956, and another 14 pct gain is looked for during 1958.

Mills Grab Missile Orders

Major steel mills are putting a new push behind missile metals. With commercial markets soft and knowing missile progress is a must, they're accepting practically all orders. In many cases they're losing money meeting tough specifications for small quantities. Gage and width tolerances are big headaches. Strength requirements are over 200,000 psi.

Powdered Titanium Parts

An eastern firm is mass-producing powdered titanium parts in a wide range of types and sizes. Emphasis is on small bearings, cams, gears and controlled-density filters, but it is possible to make much larger elements, the firm says. Advantages claimed for the sintered products include: precise shapes that need no machining, high production rates, no scrap.

In 42 years of exclusive worm gear manufacture, including hob making experience, Cleveland has developed its engineering and production facilities to establish accurate duplication of parts as standard practice.

Photo shows typical hob and gear setup in a hobbing machine.

CLEVELANDS save you money on replacement parts

NOT once in a thousand times will this happen—but, with Cleveland you can order a new gear which will run correctly with an old worm that's still good after working perhaps 20 years or more. That's the kind of service you can expect from Cleveland—and here's why!

At the Cleveland factory are stored over 1,300 *different* worm gear hobs and master worms. This enables us to duplicate with precision any gear (or worm) that has *ever* left our plant. This means that if a gear *alone* should ever need replacement, you do not have to buy a complete new drive. Instead, just give us the particulars on your Cleveland speed reducer, no matter how old—10, 20, 30 or even 40 years! In short order, we'll have a new gear ready for you—one that will run perfectly with the older worm.

By supplying parts on this basis, Cleveland may be able to save you the cost of a *complete* new drive or the extra expense of special tooling. Isn't this the replacement protection you want when you buy worm gear drives? The Cleveland Worm and Gear Company, 3282 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

CLEVELAND
Worm Gear
Speed Reducers

Where to Look For Missile Business

ARMY

Companies interested in the Army Missile Program as a prime or subcontractor may contact U. S. Army Ordnance Corps District Offices to discuss procurements on a prime contract basis and possible subcontracting sources.

Ordnance District Offices are located in these cities: Birmingham, Ala.; Boston; Chicago; Cincinnati; Cleveland; Detroit; Los Angeles; New York; Philadelphia; Rochester, N. Y.; St. Louis; San Francisco; Springfield, Mass.

These companies have prime contracts with the Army and utilize many subcontractors: Western Electric Co.; Douglas Aircraft Co.; Raytheon Manufacturing Co.; Firestone Tire and Rubber Co.; Gilfillan Brothers, Inc.; Chrysler Corp.; The Martin Co.; Utica-Bend Corp.; Emerson Electric Co.

NAVY

Companies interested in Navy missiles may contact the following Small Business Specialists for information on how to proceed:

Small Business Specialist — Bureau of Aeronautics—Dept. of the Navy

Small Business Specialist—Bureau of Ordnance —Dept. of the Navy

Among Navy prime contractors in missile work are the following:
Bendix Aviation Co.; Convair Div. of General Dynamics; Chance-Vought Aircraft, Inc.; Douglas Aircraft Co.; General Electric Co.; Lockheed Aircraft Co.; Philco Corp.; Raytheon Manufacturing Co.

AIR FORCE

Companies desiring procurement information relative to Air Force missiles should contact the Small Business Specialist at the Air Procurement District Offices nearest their location. They are located in the following cities:

Boston; Newark, N. J.; New York; Philadelphia; Rochester, N. Y.; Chicago; Milwaukee; St. Louis; Dayton, O.; Dallas; Cleveland; Detroit; Indianapolis; Tucson, Ariz.; Los Angeles; San Diego. Calif.; Atlanta; San Francisco.

These companies have prime contracts with the Air Force in the missile field:

Boeing Aircraft Corp.; Convair Div. of General Dynamics; Douglas Aircraft; Lockheed Aircraft Corp.; The Martin Co.; North American Aviation, Inc.

Ideas or inventions believed to have Air Force applications to missiles may be submitted to:

Office of Technical and Industrial Relations—Air Research and Development Command—Box 1395 —Baltimore 3, Md.—Attn: Inventions Evaluation Branch

Let's Be Realistic About The "Missile Boom"

The billions for missiles aren't easily translated into business for metalworking. The missile field will be profitable for many, but it is not an easy field to get into for most companies.

▪ Upwards of $3 billion will be spent this fiscal year on missile procurement. When all expenditures for the missile program are added up, it will total about $5 billion.

But to date the missile program has been far from a boom for metalworking. And even under the accelerated program, the picture is not likely to change radically.

A New Concept—Some prime contractors and major subcontractors will find the missile program an

expanding and profitable area. With electronics constituting the major part of any missile, electronics manufacturers will find it a natural market to exploit.

But for firms that are not already in the missile program, it will be a tough nut to crack. Just as the missile brought in a new concept of defense, it brought in a new type of defense business.

Too Late for Some—What sets the missile program apart from conventional defense efforts?

There are 43 announced missile projects under way, either in production or in some stage of development. These range from small antitank missiles to the giant Atlas intercontinental ballistic missile.

But for all of these missiles, prime contracting and subcontracting jobs were lined up as much as five years ago. An outsider has little or no chance of getting into any of the missile projects that have been made public.

Few Have Facilities — Missile work is not the kind to which most metalworking firms can readily adapt, even those which have been supplying the aircraft industry.

The high degree of precision and accuracy required of missile parts takes facilities that are not generally available. A source at the Army's Redstone Arsenal, which has the responsibility for all of the Army's missiles, says no single plant was found with "facilities in being" for any missile.

No Mass Production—Rates of production are much lower than generally expected. This, combined with the precision work required, does not lend itself to mass production techniques generally related to metalworking.

Much of the money currently being spent on missiles is for study or research and development contracts, with no guarantee that production will follow.

There is virtually no repetitive work in the missile program. However, programs of standardization are under way and may serve to create longer production runs on some parts.

Sad Example—Here is an actual illustration of what can happen when a company tries to get into the missile program:

One reputable metalworking company came to the Industrial Div. of the Redstone Arsenal with a plan to cut the cost of one small part from $10 per unit to $2 to $3. Obviously a saving worth looking into.

But investigation showed the company would need $3 million for tooling up a cold-drawing facility. To get the low cost would require a production rate of 10,000 units per day. The hitch? The 10,000 units would be more than a year's requirements.

Try Subcontractors—Best advice, according to people in the procurement areas of the missile programs, is to contact prime contractors and major subcontractors.

ICBM: This is Convair's Atlas in recent successful launching.

How a Company

The billions of dollars pumped into the missile program make an intriguing target for many metalworking firms.

For those who are considering the plunge, the experiences of this major supplier of missile parts may be of value.

▪ The big missile push hasn't brought any sudden surge of new business for the Scaife Co., a supplier of high performance rocket motor bodies.

This Oakmont, Pa., company, for example, has produced most of the motor hardware for the Falcon, worked on the Nike sustainer assembly; and produced all of the boosters for the latest version of the Matador.

"There, a company may have a chance," says a top official at the Army's Redstone Arsenal. "If a company can convince a prime contractor or subcontractor it can cut costs somewhere on an item, it may be able to get the business.

"However, we are always glad to listen to a company that claims, from prior experience, ability to produce any part at a lower cost," he said.

Where Money Goes—Latest Defense Dept. figures show preliminary obligational authority for missiles in fiscal year 1958 at $4.638 billion. It will probably come closer to $5 billion before the year is over.

This includes the cost of bringing guided missile weapons to operational status, research and development, production facilities and tooling, procurement, contract and military overhead to support missile testing, and certain construction costs for research and development.

The recent stepping up of the missile program is already having some effect. And many new study or research and development contracts are coming up for bids.

IRBM's and ICBM's—As far as existing programs are concerned, the major change from the accelerated program is a big push for the intermediate range missiles, the Thor and Jupiter, and for the intercontinental ballistic missile, particularly Convair's $2 million Atlas.

There is also some speculation that smaller missiles will be cut back in order to preserve funds for the ICBM and IRBM programs, as well as other new weapons outside the missile program.

Market Possibilities—An area of importance to metalworking may be in launching sites. Although IRBM's are constructed to be mobile, apparently many launching sites are to be built. One source estimates a launching site's cost at $5 million, compared to the cost of one missile of about $1 million.

Another market being generated by the missile program is in measuring devices and metering for testing facilities. Because of the complexity of testing and measuring, this opens a wide area for instruments and data-receiving equipment.

Study Contracts—The new study contracts now being placed have served as a stimulus to contractors in the missile program. It's estimated that probably a dozen electronic companies in the field have been kept alive by the acceleration.

However, the program won't bring a rapid increase in production and material requirements. Most of the work in the electrical field, for example, is in study and development. These areas will take more money than production and prototype work in 1958 and for some time to come.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Looks at the Missile Program

But now the program seems ready to roll again. New business is coming up for bids, much of it in research and development. Scaife will get R & D orders for perhaps 10 motor bodies.

It makes these by a reverse drawing process. Exhaustive X-ray and sonic examinations are made. On both production and development jobs, more man-hours go into inspection than fabrication.

After fabrication, the motor body goes through pressure tests. Elaborate strain-gage rigs may be applied to locate critical points. There is much fussy, groping activity in early R & D models until designs are refined by exhaustive checking and testing.

Metal problems are arising from a constant increase in reduced weight requirements resulting in lowered safety margins. The walls of a missile body will often run under .050 in. and must withstand stresses over 240,000 psi. The missile safety factor of 1.07 to 1 compares to 5 to 1 in commercial design.

Any metal defect can mean failure during fabrication, testing or actual use. Steels being supplied are not, in many cases, meeting performance requirements with any uniformity.

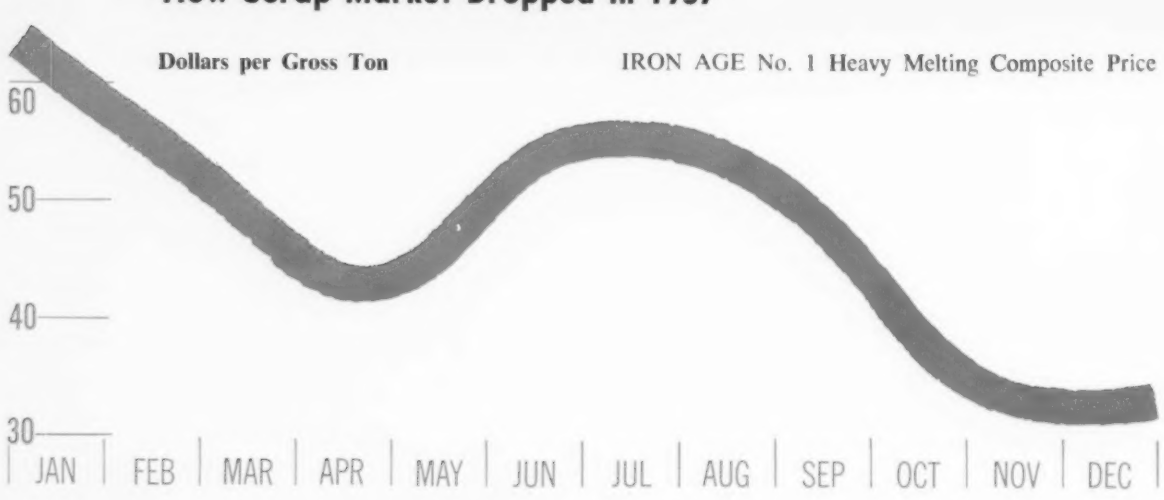
The company contends metal problems for missiles could be licked most quickly if it is recognized that this is an entirely new field and materials must be designed to meet the need.

Rocket motors are generally simple structures, but their very light weight poses severe material and design problems never before encountered. Missile tonnage is increasing, but it is still less attractive to the steel industry than other defense business. On one recent project, the weight of steel in the missile was only 1.5 pct of that required for the whole program.

Scaife uses aircraft quality alloy steels, melted in electric furnaces and processed carefully through all operations.

There is some thinking in high military circles that missile motor metals should be vacuum melted. It's recognized that performance requirements are making demands which are as yet largely untried by the steel industry and fabricators.

The Scaife Co. is headed by A. V. Murray, company president.



Scrap Sweats Out Market Slump

Industry battens down the hatches while waiting for market upturn.

Most look for trend to reverse itself by mid-year. Optimistic over long term.

Says Meyer W. Abrams, Philadelphia scrap dealer: "Nowadays we turn out the lights if they aren't being used."

"We're cutting corners wherever we can," adds a Midwestern dealer. "We're down to five yard people from 10 and I'm thinking of laying off another. We didn't have a Christmas party or give out bonuses last year, either."

Behind Industry Sentiments—The comments typify the mood of iron and steel scrap people the country over. Reason: They're sweating out their worst market letdown since 1954.

Scrap prices have plummeted from over $63 per ton for No. 1 Heavy Melting to the low $30's in the last year. (The IRON AGE Composite) Orders have been few and far between. Companies depending solely on domestic business are having a hard time of it. A few fringe operators have dropped by the wayside.

Long-Term Optimism — Scrap sales last year totaled 35.6 million gross tons, compared with about 40 million tons in 1956, reports the Institute of Scrap Iron & Steel, Inc. But scrap exports were at an all-time high—5.6 million gross tons compared with 5.4 million in 1956. Bulk of this went to the European Coal and Steel Community countries, and Japan.

Still, IRON AGE editors found few companies pessimistic over long-term prospects. The immediate problem is lack of orders. Even the low prices of recent months have failed to generate much new business.

Upturn Ahead?—Yet it would not take much to spark an upturn. The market appears to have settled down to a stalemate that could indicate a bottoming out in prices. Mills are meeting stubborn resistance to lower price offers. Relatively small orders have tended to push up prices.

Hopefully, some scrap people point out that prices are now low enough to get mills to considering blast furnace shutdowns. A few mills have actually cut back on blast furnace output, which means increased dependence on scrap for steelmaking. But most are hesitating—for the moment, at least.

Nothing New—The situation is nothing new for the scrap industry. It's been through periods like this before. It's typical of the sharp peaks and valleys that have made life more than interesting for this major supplier to the steel industry.

Reactions of leading brokers and dealers to the present slump range from resignation to a tinge of bitterness against mill buying policies. Yet there is only lukewarm sentiment toward any proposal to seek price stability. Prevailing opinion is that stable prices in scrap would not be feasible — nor desirable. "You'll never have stability in scrap; this just isn't one of those businesses," says one broker.

Immediate Outlook — What caused the market letdown and when will it improve? Just about everyone agrees the mills overbought last summer in expectation of a business upturn that failed to develop. Opinion varies on the question of a market reversal, but most look for an improvement by mid-year.

"We will see leaves on the trees before the scrap market gets better," opines W. S. Gates, vice president, Charles Dreifus Co., Philadelphia.

"I don't see any improvement in the picture until after the mill operating rates go up," adds Mr. Abrams. "This probably won't take place for at least 3-6 months—at least not enough of a rise to strengthen the market significantly."

Long-Range View — "The mills loaded up with scrap at mid-year in anticipation of business from the automobile companies," says a Detroit broker. "The business never materialized. I don't expect an upturn—at least to $40 bundles—until at least the third quarter."

What about the long term? Is the scrap industry overexpanded? Are there too many companies in the business?

Most outfits feel the long-term prospects are good, even though at the moment a lot of expensive equipment is lying idle.

No Radical Changes — "We're overexpanded only if the steel industry is," comments a New York broker. "We assume the steel mills haven't planned to run at 60 pct of capacity. The scrap industry is geared to serve the steel industry at higher operating rates."

Prevailing opinion is that the industry will not change radically in the immediate future. Increased mechanization is in the cards, although the current tight market has forced most companies to pull in their horns on capital equipment spending. The feeling is that higher labor and operating costs will eventually intensify the swing toward more use of labor-saving equipment.

Delaware River Project

The Delaware River deepening project may become a casualty of the Administration's drive to pare all nondefense spending to the bone.

The $100-million-plus project received $6 million in fiscal year 1957, $9 million in the current fiscal year. Some $10 million is being asked for the fiscal year beginning July 1.

Is a Zinc Subsidy The Answer?

▪ An unbiased and informed observer has a suggestion for the government, to help domestic zinc miners. Subsidies would be a buffer against lower cost imports, says John D. Ridge, head of Mineral Economics, College of Mineral Industries, Pennsylvania State University.

It's stiff medicine, admits Professor Ridge. "This is, of course, far more control over his enterprise than the average operator would like."

These Wouldn't Work—The Penn State professor makes his recommendation partially by a process of elimination:

"Stockpiling has failed to provide the answer."

"Tariffs of the amounts suggested by the administration (are) insufficient to stop the foreign flood of zinc into this country."

"Tariffs much higher . . . would bar large tonnages of zinc from the domestic market, but the countries most hurt by them would be, in the main, countries whose economies we would like to support and whose collapse would be harmful to us."

Here's the Plan—Here's how the Ridge subsidy plan would work:

A tonnage quota would be set up for each company, pegged on past performance and future value. This would not be binding in that a company could produce more without penalty. But payment would be made only for zinc within its quota.

If demand outruns supply, payment per ton would drop, but the number of tons on which a company would be paid would rise. It could also be adjusted in the other direction.

Quota on Imports — Professor Ridge suggests subsidies be supplemented by a flexible quota system on imports. He favors a quota for each country sending zinc to U. S. markets.

Metal would be sold from the stockpile to fill spot shortages, and returned in cases of oversupply.

Zinc: Would Subsidies Offset Low-Cost Imports?

	Domestic Mine Production (Short Tons)	Imports	Domestic Consumption	Excess Imports and Production Over Consumption
1945	614,358	479,197	852,300	226,908
1946	574,833	376,875	801,300	98,676
1947	637,608	370,271	786,400	103,912
1948	629,977	357,476	817,700	96,872
1949	593,203	368,121	711,800	183,359
1950	623,375	435,019	967,100	73,566
1951	681,189	390,946	934,000	95,066
1952	666,001	565,474	852,800	316,730
1953	547,430	749,345	985,900	281,836
1954	473,471	612,308	886,300	170,440
1955	514,671	673,811	1,119,800	46,121
1956	537,643	770,824	988,100	307,108
9 mos. 1957*	403,811	591,013	692,149	292,785

* Source: U. S. Bureau of Mines.

TURNABOUT: Toolmaker John Godsey takes floor during weekly management meeting at City-Atlas.

Why Better Communication Pays

Three years ago an Ohio firm, City-Atlas, began an all-out drive to improve its communication system.

The benefits are impressive, welcomed by both management and employees.—By T. H. Rohan.

▪ "We are no longer just in the tool business. We are also in the business of building people. It's paying off financially in increased productivity and increased interest in the company. But it's also paying off in a feeling of accomplishment and a security based on understanding and increased ability."

That's the way Claude Wilson, Jr., president of City Tool Corp. and Atlas Tool Designers, Inc., of Dayton, O., evaluates the firm's experience with its communications program. He also points out some of the tangible improvements the plan produced:

What Resulted—Employees are flooding management with suggestions faster than they can be absorbed and analyzed. More realistic shop delivery schedules are now used. Productivity has increased. Psychological trouble spots are being eliminated. Company paperwork routines are streamlined. Worker gripes now get a thorough airing.

The program started 3 years ago. Mr. Wilson decided that the 12-year-old company had matured enough so that the main goal was not survival, but developing the talents and abilities of personnel at all levels. The tool and die makers especially — highly creative shop men in the $10,000 a year class —were expected to be a fertile field.

Channel Making — A year ago, Ted Otteson, previously an independent consultant and psychologist, took over the unprecedented communications job, working at all levels with full backing of the president's office.

"My job is the creation of understanding," he says. "I have gone so far as to put the president on the pan (with his agreement) and cross-examine him in an employee meeting. In the past, no one would speak up in these meetings. But in the last year, we have had meetings with everyone trying to speak at once, asking questions and offering suggestions.

Atmosphere Creating—"We have found most troublemakers are those for whom the company isn't dynamic enough. Now we are creating a dynamic atmosphere, strong enough to absorb and use all the ideas flooding us.

"I've discovered that every idea I can think of—even in my own field—is in somebody else's head. All we have to do is get it out in the open, and get it a hearing.

"We give all the likely ones a whirl, or have someone explain to

the suggestor why they won't be used or won't work."

Here are a few of the measures adopted: Dale Carnegie courses for all employees who wish to take them. (Some 30 have responded.) Speed reading courses. Company-underwritten night school courses with employee cost pro-rated according to grade earned. Training courses in communication for all supervisors. Surveys on what employees think of the company and management.

Daily activity reports made by supervisory management and circulated. Cross-examination of company officials by plant men in employee meetings. Giving free rein to creative instincts of highly paid tool and die makers and designers.

Voice from the Shop—Atlas Tool Designers, Inc. and City Tool Corp. are the same company but different corporate entities. Atlas handles design and City Tool does manufacturing, both in the same location.

At City - Atlas, communication goes far beyond the usual routine of president's letters, bowling team, executive memos, hopeful open-door policies, employee meetings, and the annual Christmas party. Mr. Wilson and Communications Director Otteson have literally beaten down the walls of communication barriers between workers and management and between the company, its customers and the community.

Staff meetings were formerly irregular and dominated by top management. Open discussion of the problem has now resulted in a systematic weekly meeting in which all department heads participate. This has developed into a review and planning session, and the complete minutes are posted on the bulletin boards in the shop and mailed to stockholders.

Workmen in every department take turns attending the weekly staff meeting. And they report and participate on the same basis as the department heads.

Capital Goods Export Pattern Changes

▪ The type of capital equipment that foreign firms are buying in the U. S. has undergone significant change in the past decade.

Growing demand overseas for American-made industrial machinery has been accompanied by a tapering off in sales of items such as tractors, farm equipment, and office machines.

Ten Pct Gain—A machinery and Allied Products Institute team dug into the statistics and learned that industrial equipment makers increased their share of the capital equipment export total from 49 to 59 pct since 1947. Electrical machinery exports, meanwhile, have kept a fairly even keel since that year.

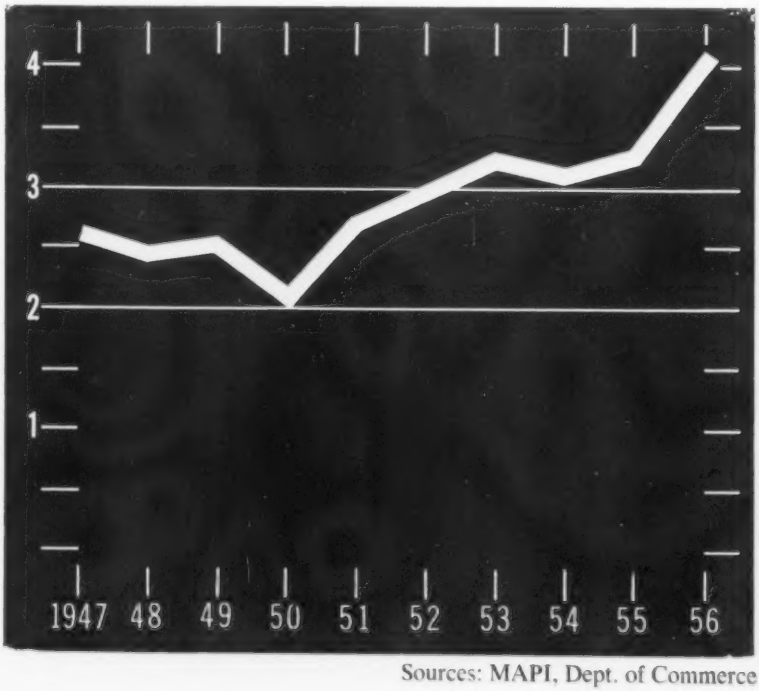
Total value of capital goods exported in 1956 was slightly over $4 billion. In 1947 it was $2.6 billion. But the actual physical volume of exports was not appreciably higher in 1956 than in 1947, MAPI points out. The increased dollar volume was largely due to higher prices.

The Leaders—Within the industrial machinery group, the largest gains have been in construction, excavating, mining, and related machinery. Considered as a single category these products' share of the export market rose from 20 pct in 1947 to 37 pct in 1956.

Metalworking machinery, meanwhile, had dropped off. Its percentage of the industrial machinery market dipped from 16 to 11.

A Decade of U.S. Capital Goods Exports

Billions of Dollars



Sources: MAPI, Dept. of Commerce

No Letup in Utilities' Growth

It Means Backlogs for Power Equipment

Utilities plan to add 30 million kw by 1960. Turbines, boilers and generators must be ordered three years ahead.

But power equipment makers expect severe competition by 1960.—By G. J. McManus.

■ Looking a little like the last of the big spenders, electric utilities continue to invest heavily on a growing power market.

The utilities figure they will face a peak demand of 140 million kilowatts in 1960. That would be nearly 30 million kw over the 1957 peak. To provide the added juice, power companies have staked out programs that will cost something like $5 billion a year through 1960 and add an average of 11 million kw a year in the same period.

Orders Are In—For makers of power apparatus, this growth meant record shipments last year of 15 million kw in generating equipment. An 18 pct jump in shipments in 1958 will add nearly 18 million kw. Gains for 1959 and 1960 will be only slightly less.

The nice thing about this future is that it is all nailed down with firm orders. Big turbines, boilers, and generators must be ordered about three years ahead. Power companies must commit themselves now, or very soon, for 1960 construction. Operating with a skimpy power surplus (16.7 pct) and living with an ironclad growth pattern, they have had to think big.

Generator Backlogs—They have ordered 389 big generators for operation in the next four years. Over 170 of these will come on stream this year. Over 70 have already been ordered for operation in 1960. Twenty-six have been ordered for 1961 or later.

These commitments add up to $10 billion as the combined backlog for makers of electrical equipment. Moreover, the orders for basic generating units assure comparable outlays for distribution and transmission equipment. Lead time is shorter in this field; power transformers are available in 9 months; and builders are scrambling for their shares of the '58 take.

Roughly half the utility buying is for distribution and transmission equipment. Orders still to be placed will determine whether individual companies go forward in 1958.

For large generators (10,000 kw and over), 1958 is a closed issue. Toward the end of 1959 there is a little open space (1.3 million kw) and manufacturers could still take orders for delivery in this period. In 1960 more than half the manufacturing capacity remains unbooked (9 million kw).

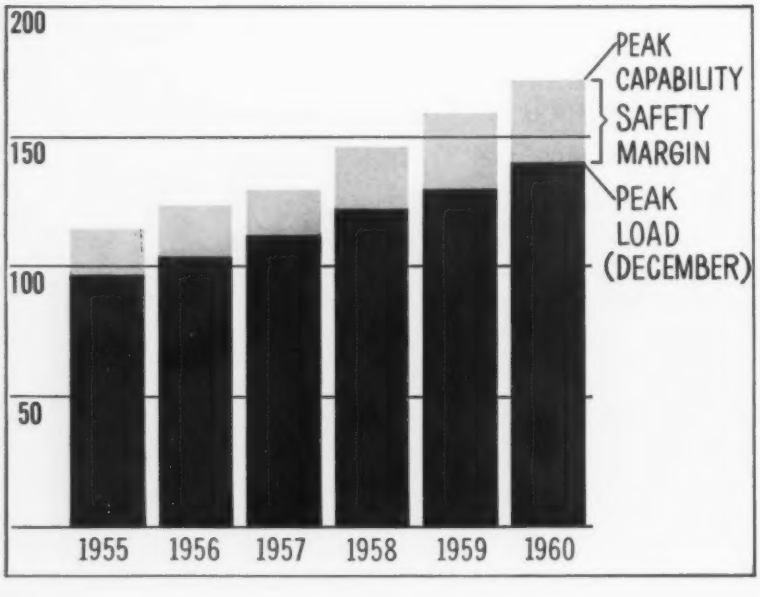
Competition in 1960—Schedule openings will probably shrink when all contracts are reported but there is enough available capacity to produce stiff competition for business in 1960 and later. Moreover, last year's bookings were more than 6 million kw under the record new orders of 1956.

Weighed against fat backlogs and long term prospects, these conditions would not cause undue alarm in most industries. However, the makers of power equipment were badly burned the last time competition got out of hand. Price cutting of the 1955 "White Sale" left them with profitless orders that are just now being cleaned up.

Price Factors — Now they are sitting nervously on top of prices that were raised sharply last year.

Power Demand and Capacity Grow

Millions of KW



How the Hydrometallurgy Process Works

In hydrometallurgical extraction, the ore is crushed, and may then be washed or roasted.

The powdered ore is dissolved in a leaching solution. The dissolved metals are treated with chemicals to produce compounds that will precipitate out of the solution.

The metal is scrubbed from the precipitate and the leaching solution may be recirculated to a new batch of ore.

In solvent extraction, the ore dissolves in an organic solvent. In an ion exchange resin, the diluted metal passes through a column of resin particles. These pick up metallic ions and remove them from the solution.

Men in the business say that hydrometallurgy is beginning to draw a lot of interest—Tonnages of assorted metals produced by this process are increasing almost daily.

Hydrometallurgy: On the Road Up

It's been a long time coming, but this once minor process is finally coming of age.

Among its potential users are refiners of rare non-ferrous metals.—By K. W. Bennett.

▪ Hydrometallurgy is an old (1880) process with a new look.

At least nine new uranium plants using this process are under construction or are on the drawing boards. And at least nine more hydro plants for producing other metals are planned, being built, or have come "on stream" in the past 45 days.

A quick count shows that about 85 U. S. firms are either experimenting with or are engaged in hydrometallurgical extraction.

It's Paying Off—Why this sudden revived interest in an old process? The answer is that the process has finally been perfected to the point where it is economical. Helping out is the use of high-pressure oxygen and hydrogen as a reducing agent, growing use of ion-exchange resins, and improved solvent extraction techniques.

Some industry sources say hydrometallurgy is merely at the threshold of its full potentialities. Experimental work in the solvent extraction method, for instance, should soon allow economic use of lower grade cobalt-nickel ores.

Interested Spectator—The aluminum industry is tight-mouthed but watching carefully an acid leach method that will reduce use of high grade bauxite ore and allow aluminum extraction from low grade clays. This may be 5-10 years away, but already it is drawing interest.

Aside from uranium and aluminum, 15 other metals are currently being refined hydrometallurgically. They include copper, nickel, cobalt, niobium, tantalum, vanadium, zinc, manganese, molybdenum, thorium, lithium, zirconium, hafnium, columbium, beryllium. The method is also under test to reduce pyrrhotite to a high-purity iron and sulfur.

New Market Opens—For metalworking, it is a growing market worthy of note. All the new plants require numbers of 300 series stainless steel tanks, some up to 20 ft in diameter, others that are narrower but tower five stories high. They also need valving, piping, metering, heating equipment, heat exchangers, pumps, ore crushers, and other equipment.

Current interest is bringing a rash of small pilot plants, similar in makeup to the production plants, though smaller in size. A whole new round of plant construction is expected when Canadian mining areas under exploration approach the producing stage.

The Builders — Uranium plants being built or contracted for at the moment are valued at $63.3 million. The biggest is the Kerr—McGee plant in New Mexico, worth $16 million. The Lucky Mc is a $7 million plant. Homestake-New Mexico and Homestake-Sapin are building two plants for $14 million.

Other uranium plants will be built by Gunnison Mining, Phillips Petroleum, Union Carbide Nuclear, Lakeview Mining, and Fremont Minerals. Firms engaged in the design of hydrometallurgical plants report the number of customer inquiries is growing.

Lindsay Chemical, biggest of the rare earth producers, got raw rare earths as a byproduct in producing thorium by this process. Other companies are following suit.

Interest in hydrometallurgy is spreading outside the metal-producing field. For example, the process is used for removing metal from liquid plant wastes by a number of companies, including Ford, General Motors, Electric Auto-Lite, American Rayon, and Perfect Circle Corp.

Can Competitors Hurt Tinplate?

Sales Official Sees no Immediate Threat

GEORGE TOTTEN: "New uses and population mean more tinplate."

■ Is tinplate getting a little rusty around the seams? Is the whole can market running out of gas?

A firm, "No," to both questions comes from U. S. Steel's George Totten. "It's going to be pretty hard to ever find a substitute for tinplate in cans," he says. "And there's no reason to expect a change in the steady growth of can usage."

Retiring manager of tinplate sales at the Corporation, Mr. Totten speaks as one who is close to the action, but detached from it. He is stepping out after a tinplate career that stretches back over 40 years and takes in top sales jobs at Jones & Laughlin, (1910-31) Republic Steel, (1931-36) as well as United States Steel, (1936-57).

Blackplate Drawbacks—Pointing out that an extended period of progress lies behind modern manufacture of both cans and tinplate, Mr. Totten sets the present picture in long-range perspective.

On the question of a tinless can (blackplate with a chemical coating), he sees two objections: First, the seam would have to be cemented and the can could not be used for process foods. Secondly, canmaking speed would be relatively slow because of the seaming method. He points out that tin not only provides a protective coating; it facilitates rapid soldering.

"Barring a tin shortage, it's hard to see blackplate replacing tinplate in cans," says Mr. Totten. And he can't see the tin supply running out in any emergency of the kind we have known in the past.

Aluminum Can Limits—On projects like the Reynolds Aluminum can, Mr. Totten avoids specific comment. He does refer to a number of "unsound proposals," saying these could be a problem for tin mills in the future.

On the whole question of aluminum cans, Mr. Totten notes the statement of a can company executive who sees them being used for high value products, where the container is only a small fraction of total cost.

Mr. Totten points out there have been shifts in the tinplate market before. Aluminum and plastics have taken over from tinplate in many cap applications. At the same time, tinplate has moved into important new jobs.

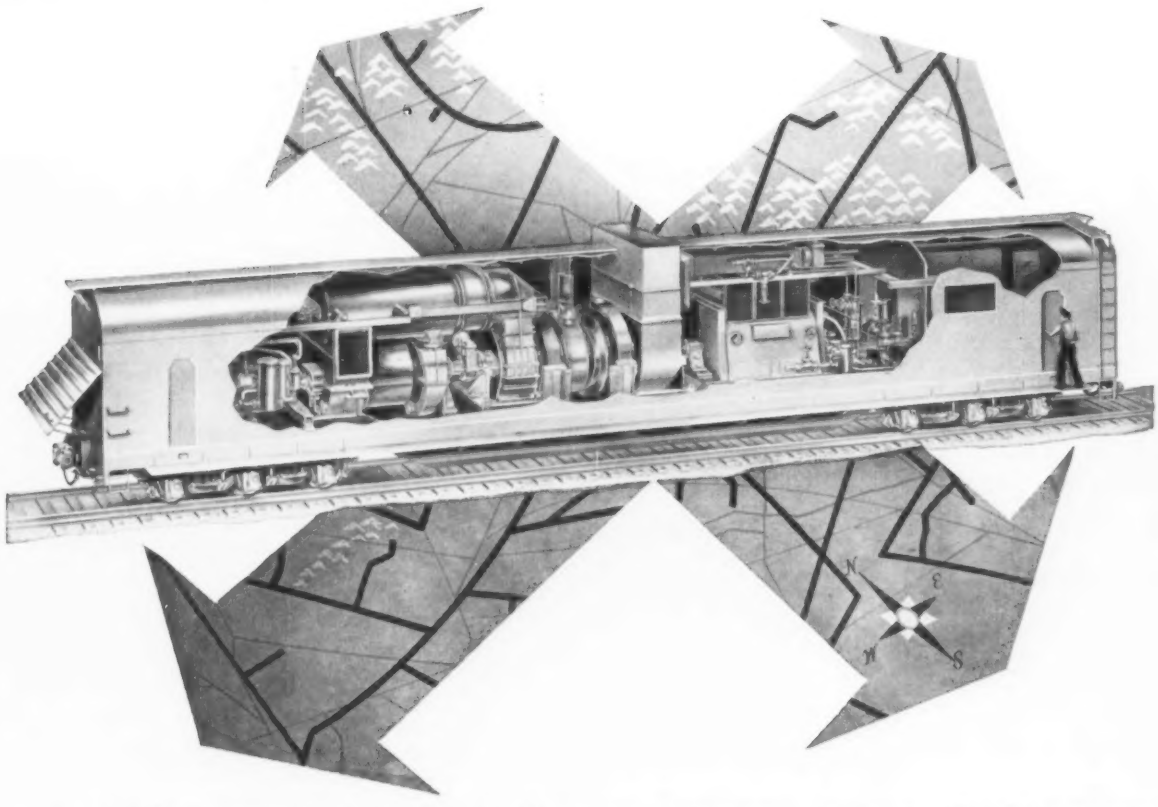
Tinplate Still King—Biggest of these is the beer can, which has taken much of the sting out of seasonal swings in tinplate shipments. There was a time when some tin mills worked only three or four months out of the year. That was when cans were almost entirely for food. Today, one out of every five cans is for beer. Seasonal ups and downs have been modified although not eliminated.

Adding up the plus and minus factors, tinplate still dominates the can market by an overwhelming margin. Over 40 billion cans a year are made of tinplate. Biggest single application for a competitive metal will be the 35 million aluminum oil cans for Esso. This amounts to less than 1 pct of the total cans made.

Upward Trend — The current market picture for tinplate is a little hazy in one respect. The Can Manufacturers Institute says nine-month consumption of steel by its members in 1957 was down 3.2 pct from 1956 totals.

But over the nine-month period, tinplate shipments were up to 4.97 million tons in '57 from 4.88.

KILOWATTS



...where and when you need them

Heavy temporary electrical loads out at the end of the line present a serious problem to most electrical utilities particularly when the industry served is an important one.

There is, however, a practical answer to peak loads or emergency needs . . . the Clark Turbo-Mobile Power Plant. This gas-turbine-driven unit is a completely self-contained, rail car mounted, generating station. Burning liquid or gaseous fuels, it can generate up to 6,750 KW, measured at the generator terminals, anywhere that there are railroad tracks. And whether the "temporary" demand lasts for a day or a year doesn't matter. The Clark unit is designed for continuous 24 hour a day service for as long as required.

Stationary gas-turbine-driven generating units can also be provided. When equipped with a regenerator, a thermal efficiency of 29% is achieved at a KW output of 6,200. When used in a combined cycle, with the exhaust gases generating steam in a waste heat boiler, up to 10,000 KW can be generated at a thermal efficiency of 29%. Both efficiencies are based upon the fuel's low heat value.

Clark engineers are available to analyze your specific applications with regard to portable or stationary gas-turbine-driven generating equipment. Consult your nearest Clark representative.

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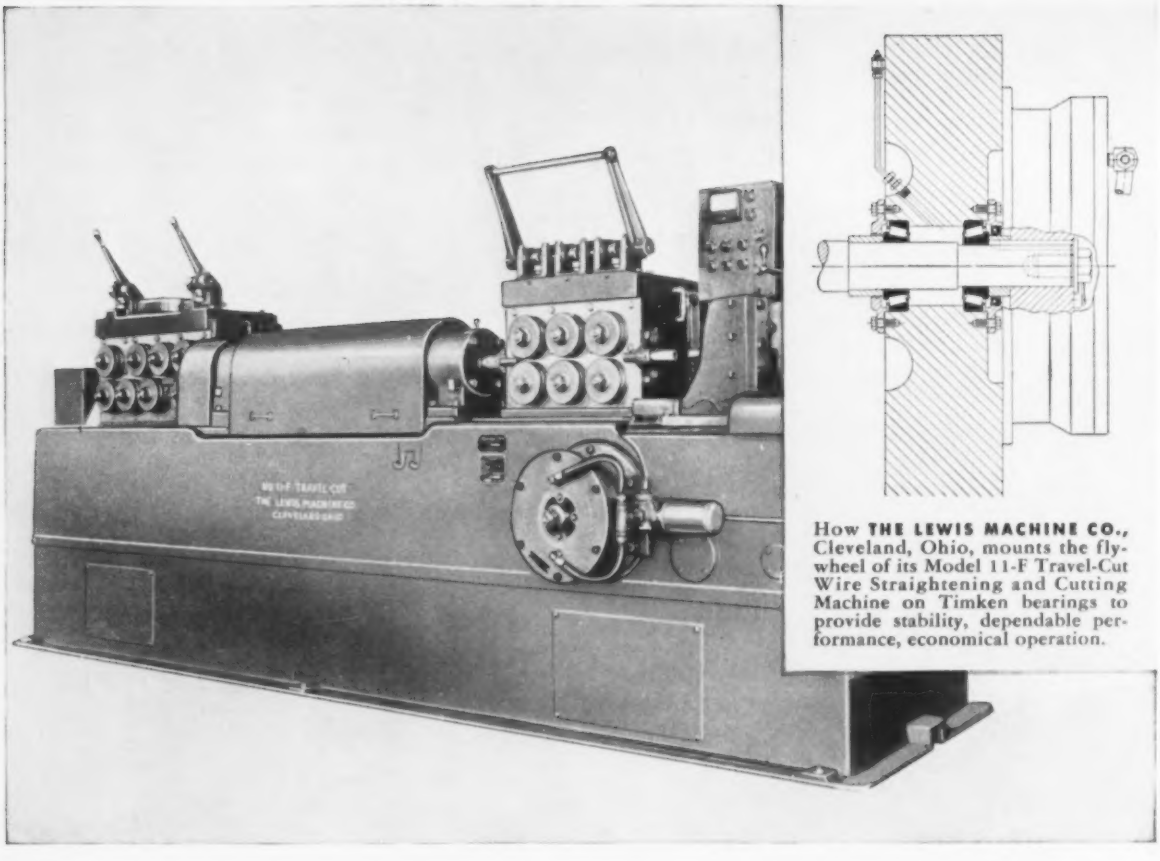


How **THE LEWIS MACHINE CO.**, Cleveland, Ohio, mounts the flywheel of its Model 11-F Travel-Cut Wire Straightening and Cutting Machine on Timken bearings to provide stability, dependable performance, economical operation.

How TIMKEN® bearings keep flywheel stable on automatic wire straightening and cutting machine

TO take the varying loads of automatic wire straightening and cutting, the bearings in this Lewis Model 11-F Travel-Cut have to be extra tough and virtually friction-free. That's why The Lewis Machine Company uses Timken® tapered roller bearings for the flywheel, feed rolls and drive—38 in all. Timken bearings keep the flywheel stable and rotating freely, position gears and feed rolls accurately even under heavy loads.

EXTRA LOAD-CARRYING CAPACITY. Full line contact between their rollers and races gives Timken bearings extra load-carrying capacity. Tapered design lets Timken bearings take *both* radial and thrust loads in any combination. The flywheel doesn't wobble. Gears and feed rolls *stay* in position.

PRACTICALLY FRICTION-FREE PERFORMANCE. Because they're geometrically designed to roll true, and precision-made to live up to their design, Timken bearings virtually eliminate friction. They run smoother, last longer.

NO SHOCK PROBLEMS. Because they're case-carburized, Timken bearings' rollers and races have a hard, wear-resistant surface over a tough, shock-resistant core. They *absorb* shocks, reduce maintenance.

That's why it pays to specify bearings trade-marked "TIMKEN". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable: "TIMROSCO".

This symbol on a product means its bearings are the best.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS ROLL THE LOAD

Stockholders OK Merge

Stockholders of Climax Molybdenum Co., and of The American Metal Co. put their stamp of approval on the merger of the two companies.

Over 69 pct of Climax shareholders voted yes. And almost 86 pct of American Metal's owners approved. In both cases a two-third vote was required.

The new company will be American Metal Climax, Inc. It will be run by a combination of the top management of both firms.

The Climax operations will be continued by Climax Molybdenum Co., a division of the new group.

Armco-National Merge For Better Balance

Proposed acquisition of The National Supply Co. by Armco Steel Corp. would balance out the operations of both.

Armco would be in the pipe business in a big way, with 700,000 tons of pipemaking capacity near Pittsburgh, and a going network of oil country stores in this country and abroad. At present Armco has 155,000 tons of pipe capacity, most of it spiralweld.

National Supply would get an assured supply of semi-finished steel. It can make only 50,000 tons of steel a year and has had to depend on integrated mills for most of its supply. Armco would bring over 6 milling ingot tons to the new union.

Long Discussion—These considerations recently brought an agreement in principle between the two companies after 10 years of dickering.

National Supply has long felt a need to increase its seamless capacity. Since only about half its pipe tonnage is seamless, National's oil country line has been light on drill pipe, casing, and tubing.

A new seamless mill, considered for National's Ambridge, Pa., work, would have cost from $10 to $15 million. National did not want to spend this kind of money without some assurance that it would get enough steel. Reportedly, no supplier would give this assurance.

If the acquisition does go through, construction of a seamless mill would probably follow. A southern site for this seems a distinct possibility. Armco's Sheffield Division has 1.2 million tons of steelmaking capacity at Houston, Tex., and 120,000 tons at Sand Spring, Okla.

More Capacity—For Armco, the acquisition would ultimately require more steelmaking capacity.

Capacity is being increased, but in a period of peak demand, it is doubtful if Armco would have much surplus steel.

RR's Ask Freight Hike

If the Interstate Commerce Commission approves their application, the Railroads will boost freight rates an average of 3 pct. The increase will be selective rather than across-the-board, but most of metalworking will be affected.

Iron ore rates would be stepped up 10 pct, with the exception of a 5 pct boost on ore moving to Lake Superior ports.

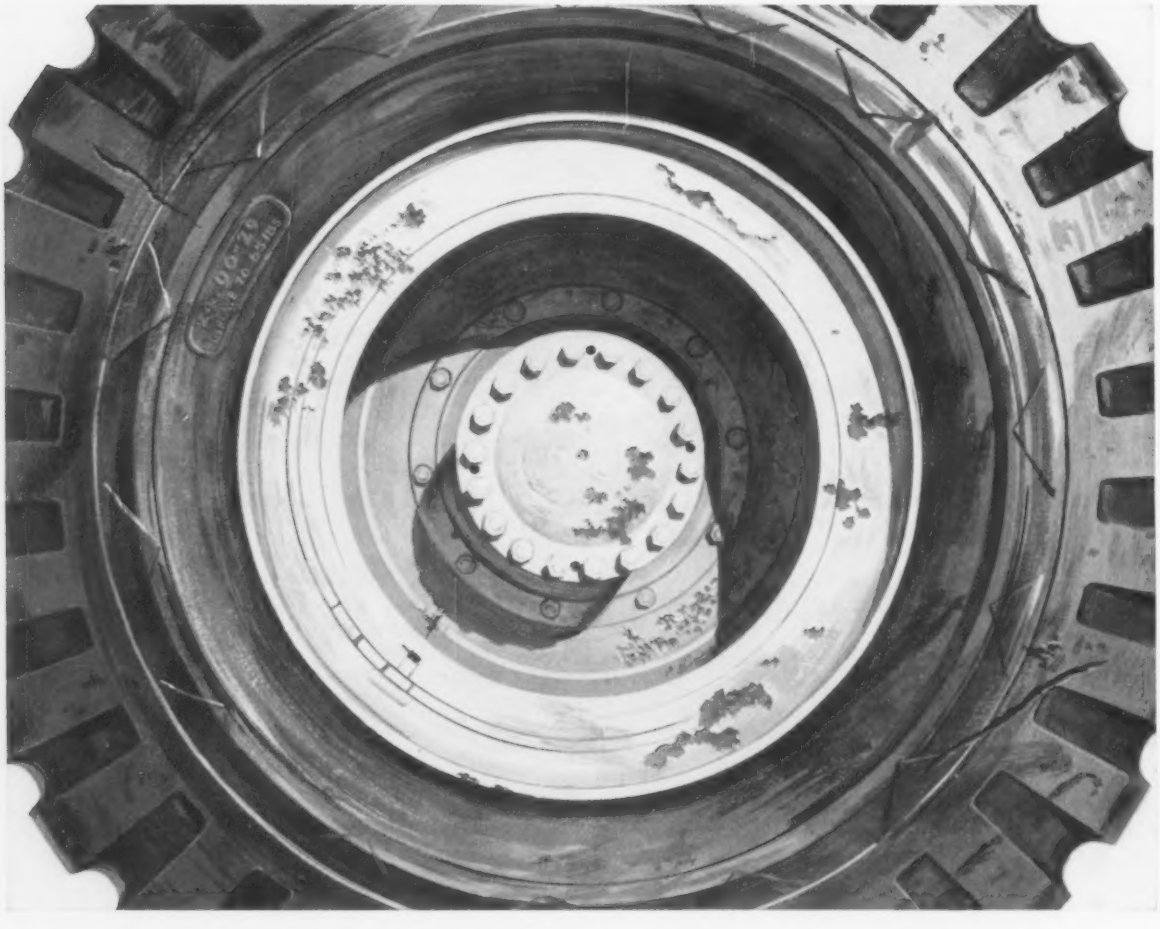
Scrap iron and steel would cost a shipper 40¢ more per ton.

No advances are being requested on cast iron pipe and fittings, farm implement parts, aluminum bar, ingot, pig and slab, copper ingot, matte and pig, brass and bronze, lead and zinc bar, ingot and pig, and magnesium metal and alloy.

Why Wait Until the Last Minute?

ANTICIPATION: National Carbon Co., division of Union Carbide Corp., has made what it calls the world's largest carbon electrode. But, there are no installations big enough for the 10-ton, 5-ft diam giant. It was built for mammoth submerged arc furnaces, still on drawing boards.

BETTER PROTECTION for metal surfaces



Isophthalic based paints last longer under severest conditions—*resistant to checking, peeling, chipping*

Now you can add years of protection to metal surfaces thanks to the adhesive properties of Isophthalic based paints. Better film to metal bond means improved performance with fewer prime coats required—saves time, cuts painting costs.

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Frank L. Magee

Looking Beyond Today's Market

Mr. Magee is an optimist whose cheerful outlook comes from years of experience.

While his special concern is with aluminum, his views can be applied to other industries.

FRANK L. MAGEE: No depression is in sight.

■ From the vantage point of Frank L. Magee, new president of the Aluminum Company of America, the dark cloud on the economic horizon has a silver lining.

Since he started with Alcoa as an apprentice in 1917, he has seen the company weather the lowest downs and the highest ups in the nation's economic history. Each time, the company has come out of a business downturn stronger than ever—and he sees no reason for alarm over the current market picture.

Cause for Optimism—"I don't see much evidence that this country is in for a depression," he states. ". . . We've had plenty of experience with quick turnarounds to the upside, and the consumption possibilities right now are enormous."

Alcoa's phenomenal growth is less a matter of economic accident and more a matter of sound management planning. Behind the company's rise into the ranks of the industrial giants is a succession of chief executives blessed with farsightedness and sound judgment—the latest of whom is Mr. Magee.

Surpluses Needed — In spite of dire business predictions, Mr. Magee has ordered no cutbacks in the company's $80 million expansion plans for 1958. His explanation: There must be enough surplus to more than supply the demand if aluminum is to continue as a hard-hitting growth product.

Alcoa's new capacity won't be written off as a loss during the anticipated slow period. "We're going ahead with building the power facilities our new plants will require because if we don't need the power when they are finished, we can sell it," Mr. Magee explains.

Grows With Alcoa — Frank Magee was born April 13, 1896, in Shamokin, Pa., the son of Bethlehem Business College President William F. Magee. When he was graduated from Lehigh University in 1917 with a degree in electrical engineering, he took the apprentice's job in hope of getting into Alcoa's hydroelectric power activities. Instead, he wound up in the sales department.

After serving two years with the Army in France during World War I, ex-Sgt. Magee returned to Alcoa's training program and subsequently was assigned to the New Haven sales office. He was in on the beginning of Alcoa's campaign to promote aluminum wire for high-tension transmission lines.

From that time on, Mr. Magee grew with Alcoa. During World War II, as the company's general production manager, he was awarded the President's Certificate of Merit. Now chief executive, a director, and member of the executive committee, his immediate goal is to complete Alcoa's expansion which will boost capacity from 792,500 tons a year to 962,500 tons.

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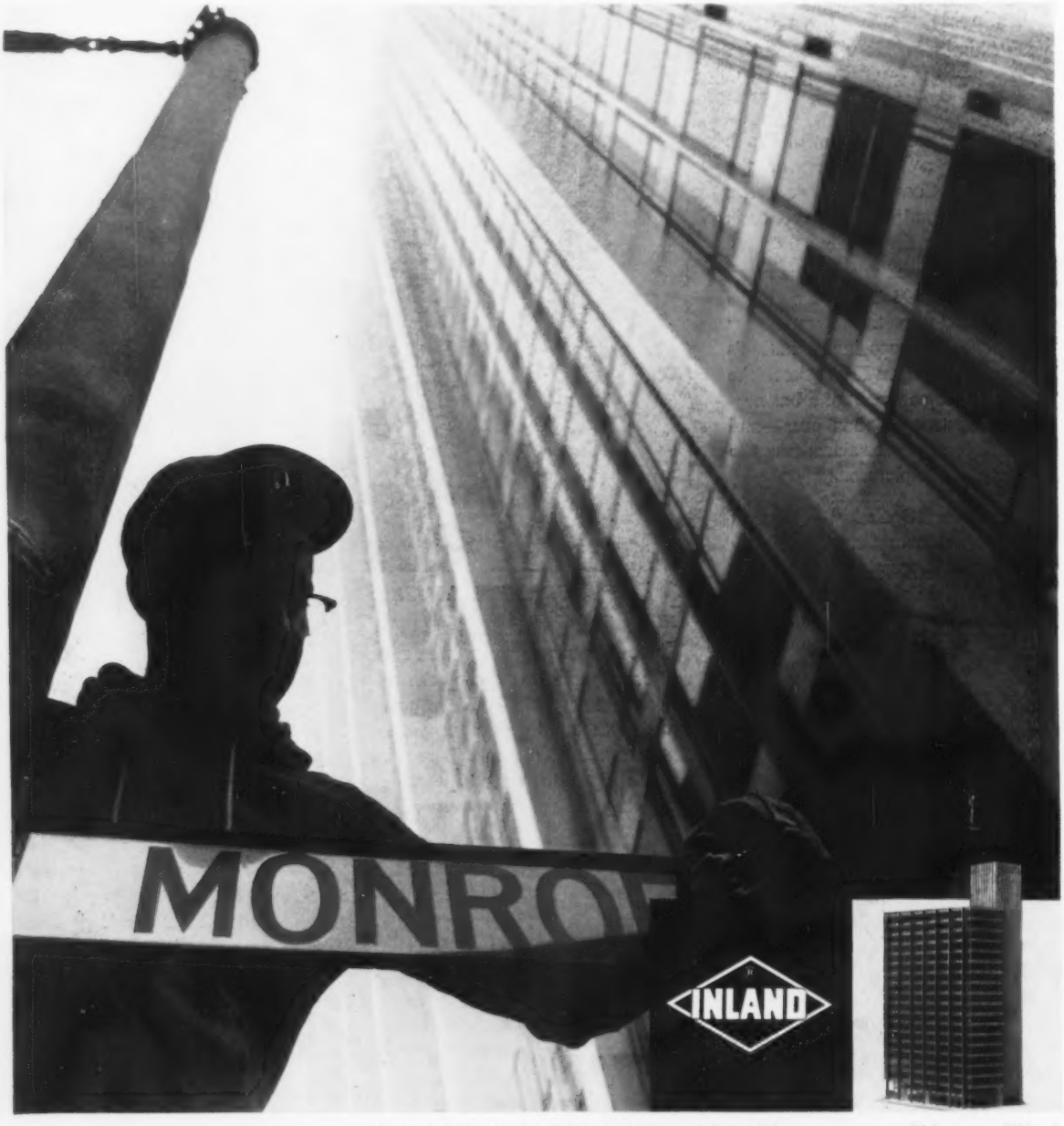

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Why Depreciation Interest Lags

It's a combination of both business and politics.

With most capital spending programs on the wane, this is not the time to move. And Congress is more interested in looking in the direction of votes.

■ It isn't likely that you will see any significant changes this year in depreciation laws.

Oddly enough, one reason for apparent diminishing congressional interest lies in business itself. There is a notable lack of energy in whipping up interest at this time in revising depreciation rules for new plants and equipment.

Reason for Apathy—The big reason, of course, is political. But there is no denying the current lack of industry interest in fighting for a modernized and more realistic depreciation law.

Why the lack of interest on the part of business? Probably because the tremendous capital goods boom of the past few years is falling off. Most industries have completed their rounds of expansion and improvement, for the time. Without new, larger outlays coming up, interest tends to lag.

Inflation Hurts—Industry generally pushes for depreciation laws which will take into account inflationary factors, by using replacement costs, rather than original cost, which must be used under present rules.

Earlier in the year, this was a hot issue, with spokesmen for most users and builders of capital goods eager to state their case. Now, only seven requests have been receivd by th House Ways and Means Committee to talk on depreciation. The subject will be covered Jan. 15.

Dead Politically—Other than the fact that heat generated by the capital goods boom has expired, businessmen may realize the issue is scarcely worth pushing aggressively at this time. Politics is working against widespread changes and business groups realize it.

This is how the Committee views the situation:

Both parties are committed to make the next tax reduction moves in favor of the general taxpayer. After the $7 billion-a-year cut in excises and liberalized depreciation rules in 1954, the next tax relief was virtually promised at the general level.

Now, with defense spending on the upgrade, and tax receipts likely to fall in view of sagging business and income, incentive to revise depreciation laws is on the wane.

A good case can be made that even if present capacity is adequate, a new law is needed to ease replacement of obsolete equipment—and, in fact, stimulate it.

A step-up in equipment replacement would help halt any recession and would be a big help to the machine tool builders, as a leading example, and other industries that may be hurt by the drop in capital outlays.

Watch Inventory Trends Closely

Important Factor—It will be important for you to keep a close check on inventory trends as the year progresses. Inventory movements will be playing a very significant role in overall business conditions.

Of course, there's a time lag before inventory figures are published. Nevertheless, a recent study by the Commerce Dept.'s Survey of Current Business points to some significant inventory trends.

Unsold Stocks Grow—For one thing, more than half the rise in inventories early this year occurred in finished goods. The previous pattern of 1955 and 1956 showed increases evenly divided among finished goods, purchased goods, and goods-in-process.

Finished goods held by durable goods producers have been rising moderately but steadily over the past year. Finished goods held by durable-goods producers accounted for $700 million of the group's total $1 billion increase in the first 10 months of 1957.

Purchased Materials Drop—Stocks of raw and purchased materials rose slightly in the first of the year, but since May have shown little gain. You can be sure, however, that since October they have declined significantly.

The study points out that a significant part of consumption of steel and nonferrous metals has come from inventories. But, conversely, primary metal producers are the only hard goods industry holding more purchased materials than at the beginning of the year. This refers to scrap and ore, for the most part. These examples point out why inventory liquidation will be an important factor for some time.

AUTOMOTIVE

Bright Metal Sales Battle Rages

Stainless Steel and Aluminum Slug It Out at Detroit

It's a strange fight. Both metals are vieing for the same market yet both are gaining ground.

There is evidence that each is beginning to fall into a use pattern.—By H. R. Neal.

▪ Stainless steel and aluminum manufacturers are keeping an eye on the automobile industry. Depending on the number of new cars built this year, they can see brighter prospects for their bright metals in 1958. Use of stainless and aluminum in 1958 model cars is higher than in 1957. So, a good automobile year will mean a boost in total automotive consumption of the two metals. A not-so-good year could cancel out hoped-for gains.

Despite gains for each, the battle to capture more of the automotive bright metal market is fierce. But there seems to be a pattern developing as to the areas of use made by the automakers. Side moldings, wheel covers, windshield and rear window moldings and some rocker panel shields give the nod to stainless. Generally, these areas need strength or are subjected to stones or bumping.

Used Together—Aluminum provides the brightness and flair for grilles and dominates this field. The light metal is also used extensively for decorative exterior panels either as extrusions or color-anodized spears of one sort or another.

In these latter uses it is usually protected from bumps and knocks by the tougher stainless trim moldings. Transmission housings and other castings make up the largest single application of aluminum in automobiles.

Easily Matched—Variety of finishes obtainable is a common characteristic to both aluminum and stainless. It allows close matching where they are used side by side, or contrasting bright and satin textures if that's what an automaker's stylist wants. An engineer for one of the automakers explained this lets them make use of the best properties of both metals—strength or light weight.

An executive for one stainless maker admitted that representatives of the two industries have, at times, "oversold" the automakers on the merits of their particular metal. "There are some areas, particularly for interior trim, where stainless isn't any better than aluminum and is more costly," he said.

"On the other hand, aluminum hasn't always been up to all the applications made of it. But it's hard to fool the automakers and

Two New Entries in the Small Car Field

SMALL AND FLASHY: Ford added 2 ft to the length and 4 in. to the width of its two-seater Thunderbird to get this new 4-passenger model. It has wider doors and fold-flat front seats for easy entry.

SMALL AND ECONOMICAL: The Rambler American, a 5-passenger sedan with a 90 hp engine, claims the lowest advertised-delivered price of any U.S.-built car. It's the only small car that has automatic gearshift.

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WHITING

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Automotive Production

WEEK ENDING	CARS	TRUCKS
Jan. 4, 1958	77,812	13,347
Dec. 28, 1957	79,945	12,397
Jan. 5, 1956	91,130	11,087
Dec. 29, 1956	99,572	12,505
TO DATE 1957	6,115,467	1,079,000
TO DATE 1956	5,801,864	1,104,325

*Preliminary Source: Ward's Reports

they make the change to the better metal when the next model comes around. But you've got to get them thinking of different applications all the time."

There's plenty of evidence that stainless and aluminum producers are "setting them thinking."

For Moving Parts—New stainless items on 1958 cars include top radiator tank and baffles on Lincoln and Continental, sealed-beam headlight rims for Dodge and Plymouth, and Dodge's grille and stone shields, to name a few.

More mechanical parts are being made of stainless too. These include heat control valves and shafts, power brake assemblies and carburetor parts. Sealed Power Corp., piston ring manufacturer, recently announced a stainless steel oil-ring assembly for pistons which is expected to give better engine protection and longer engine life.

Aluminum's Increase — This is also a busy automotive year for the aluminum industry. A Kaiser Aluminum survey shows the average 1958 model car will use 44.9 lb of aluminum. This compares with 39.6 lb for the 1957 models, and only 24.8 lb on 1955 models.

Kaiser's survey shows General Motors boosted use 30 pct this year from 32 lbs to 41.6 lb. Chevrolet made the biggest gain by increasing its use 45 pct per car. However, Chevrolet's use of 31.0 lb aluminum per car is still next to lowest for the industry.

Other Users—Ford Motor Co. increased its use of the light metal from 35.7 lb to 39.6 lb. Chrysler Corp. lowered its average use by three lb this year, but is still the industry leader with 63.3 lb. Chrysler's Imperial also continues to claim the distinction of being the top individual unit user at 119 lb, some 20 lb more than Chrysler, the next car with 98.5 lb.

American Motors use averages 48.8 lb, for second highest industry honors. Studebaker - Packard uses least with an average 22.6 lb.

Accounting for part of the rise in aluminum usage is the switch to aluminum grilles by Ford, Pontiac, Oldsmobile and Lincoln. In addition to this, Buick's new automatic transmission casing weighs 26 lb and front brake drums are aluminum in all series except the Special.

Stainless Tonnage — Stainless steel shipments to the auto industry in the first 9 months of 1957 totaled 76,757 tons—an increase of 9.5 pct over the same period in 1956. Wider use of stainless in 1958 models promises another tonnage increase this year provided auto sales remain near last year's levels.

The progress made this year by aluminum and stainless steel makers to increase the use of non-corrosive bright metal on Detroit's offerings is impressive. And it isn't likely to stop here.

Both industries are talking about using their metals for roof and body panels, mufflers, bumpers and a host of other applications. It seems a sure bet that each year will bring greater use of aluminum and stainless steel by the auto industry.

GM Expands Detroit Diesel Plant

Construction has started on a 289,000 sq ft addition to GM's Detroit Diesel Engine division plant. Clyde W. Truxell, general manager, said completion is expected next May. The new building will house all final assembly, testing and shipping facilities for Detroit Diesel.

An entirely new production system will be installed, Mr. Truxell said. It will include the addition of two new assembly lines for a total of five. Layout revisions are expected to be made without interruption of production. Detroit Diesel manufacturers two cycle engines ranging up to 893 hp.

THE BULL OF THE WOODS

YOU KNOW THAT 'OL' JOKE ABOUT TH' GUY WHOSE SOLES WAS SO THIN TH'T HE COULD STAND ON A DIME AND TELL IF IT WAS HEADS OR TAILS--WELL, THAT MUST BE HIM AN' HE AIN'T DONE ANY-THING ABOUT IT YET!
WELL, IF YOU WEAR DANCIN' SLIPPERS AROUND HERE YOU'RE GOIN' TO DANCE, THAT'S ALL! THEM'S CURLICUES -- THEY GIVE YOU THE CUE WHEN YOU NEED NEW SHOES!
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Defense Will Dominate Congress

Here's What Business and Industry Can Expect

Defense considerations will be involved in most important acts of Congress.

Everything from education to taxes will have a defense angle. —By G. H. Baker.

▪ The state of U. S. military preparedness clearly will be the hottest subject in Congress this year. It's an election year, and the atmosphere has already begun to crackle with political claims and charges on the posture of U. S. defense. But the most meaningful defense-related actions to be taken by the Senate and the House this year will center on:

Missiles and rockets.

Knowledge of outer space.

Scientific education of youths.

Specifically, here's what you can expect the Congress to do this year in areas affecting business and industry:

Defense Spending to Rise—President Eisenhower is asking Congress to vote a fast $1 billion for immediate (this fiscal year) spending on missiles, rockets, and exploration of outer space. In addition, his new defense budget for the 12-month period starting July 1 calls for an overall total of around $40 billion.

And for the first time, Ike asks for a reserve fund of a half-billion dollars to be spent—on short notice, if necessary—on missile-and-rocket research. Congress will probably approve all of Mr. Eisenhower's requests, and may even tack on to the military shopping list a few additional projects.

Taxes May Go Up—The extra dollars needed for defense have blanked prospects for tax reduction. Thus, the government's revenue picture has worsened in two ways, for spotty business conditions had already caused total revenues to decline from earlier expectations. The chairman of the taxwriting House Ways and Means Committee agrees with Ike that this is not the right time to talk of tax cuts. In fact, some spokesmen for the White House are hinting that new taxes may be necessary to meet the government's growing demands for revenue.

More Dollars for Students—Ike is asking Congress to set up a long-range program of aid to students who pursue scientific and engineering studies. It will cost about $500 million a year. The federal government would supply most of the money, and states the balance. High school students who show aptitude in the sciences would receive scholarships. Value of the average scholarship would be about $800 a year, with a greater allowance for needy students.

New Labor Laws Coming—Both parties agree on the need for a law requiring disclosure of how welfare funds are spent. But most welfare plans are 100 pct company-paid. Unions contribute little or nothing. The real fight will come over proposals to guarantee democratic processes in union management, such as letting the rank-and-file vote for union officers. And unions will fight hard to defeat efforts to ban organizational picketing and secondary boycotts. A law to ban anything that smacks of union-busting stands a good chance.

It Will Be Tough Going for Mergers

▪ Congress may act this year to make mergers difficult if not impossible. There's plenty of support for such a law. Official government figures show that firms in all industries have been buying out their competitors at a record rate. The result, in almost all cases, is less competition.

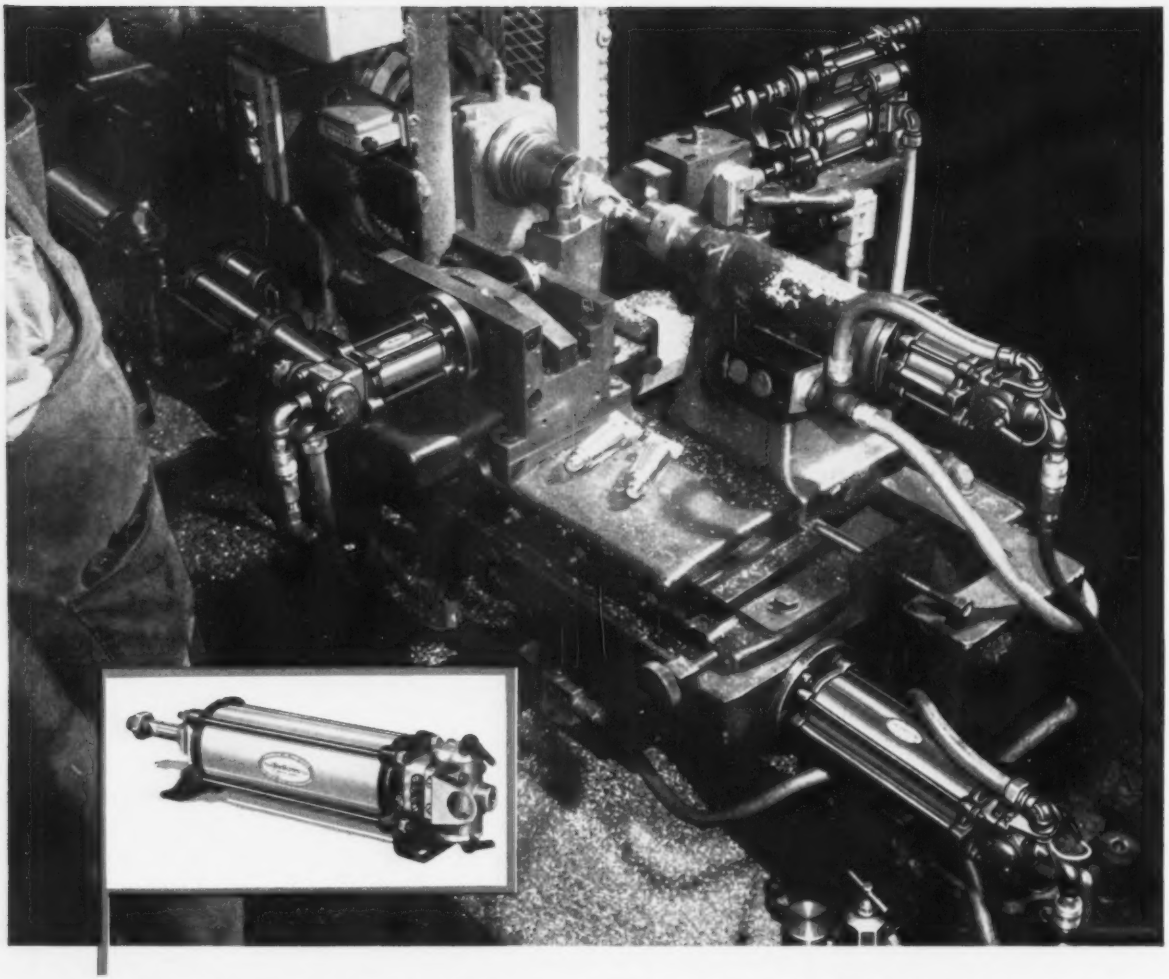
Chances are that an anti-merger bill, if allowed to come to a vote, will win by safe majorities in both Senate and House. And the President probably would sign it into law. Both parties favor such a law. Members of Congress know that a vote against "big business" is always popular with the voters.

Mergers have been consummated in record numbers in recent years. Small firms are being gobbled up left and right by their competitors.

And fewer companies within an industry often lead to illegal price-fixing, the government's anti-monopoly experts say.

Way it looks now, Congress leans toward an anti-merger law that will require all firms wishing to merge first to obtain consent from a government bureau or commission. (The Federal Trade Commission could get the job, or a new board could be set up.) Upon receiving notice of an intent to merge, the government would order the merge held up for 60 days for study. At the end of the 60 days, the federal men would announce their decision —yes or no.

The proposed law would apply to all mergers involving combined assets of $2 million or more.



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Optimism Still Strong in West

But Some Are Becoming More Cautious

Majority of 1000 Farwest businessmen in survey believe their first quarter will equal or better '57 levels.

Southern Californians are among those most enthused, northern Californians and Hawaiians the least.—By R. R. Kay.

▪ Businessmen, industrialists, and economists differ on the 1958 outlook for the 11 Western states. You get all shades of opinion—up, down, and sidewise.

Of the 1000 members on Prudential Insurance Co.'s Western Business Forecast panel, most are optimistic. They predict that their own first quarter business will be better, or at least as good as fourth quarter 1957.

More Bears Found — However, for the first time since 1954, the group as a whole shows a dip in confidence. And that's significant. For Farwesterners are usually bullish.

Nearly 60 pct of panel members expect their business this quarter to equal or better first quarter '57. Some 32 pct see gains up to 10 pct. And 11 pct look for a bigger boost than that.

As usual, optimism runs highest in the southern California-Arizona-Nevada area. Sixty-six pct expect first quarter '58 to equal or better the like '57 period. Least optimistic: northern California-Hawaii.

Northerners Cautious—Washington and Oregon businessmen don't look for any great shakes. First quarter business, they say, should be about the same as early '57—maybe a little better.

Biggest change in outlook is in Colorado - New Mexico - Wyoming. Only 54 pct now see equal or better times in contrast to 87 pct last year.

Aircraft Encouraged

Nobody will deny that the Coast's aircraft industry has had its share of depressing news. But things are now beginning to look up a bit. New Defense Department orders are on the way.

There'll be a radical bomber to fly over 2000 mph at 100,000 ft altitudes. What will it look like? Best guess: it will resemble a missile more than an airplane.

North American Aviation, Los Angeles, has a USAF multi-million dollar contract to develop it. The new bomber, tagged WS-110A, will have six superjet engines and use "exotic" fuels.

Douglas Aircraft got a $40 million order to continue work on its C-133A transport plane. The new contract will extend work on this model at the company's Long Beach (Calif.) plant until 1961.

Roof Raisers Count on Getting Big Lift

GOING UP: Workers of U. S. Steel's American Bridge Div. will use 24 hydraulic jacks to lift a 1150-ton steel truss roof into place on the dining hall of the new Air Force Academy located in Colorado Springs.

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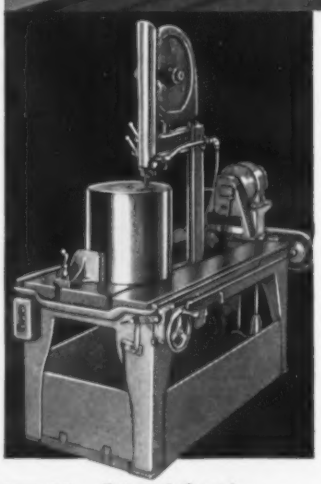
Jobs like this aren't done every day, but they serve to emphasize the versatility of the MARVEL No. 8, a truly universal metal cutting saw. If you cut, machine or fabricate metal, this is a sawing machine you should know about. Write for catalog.



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Will Sales Level Rise or Fall?

Tool Builders Keep Close Watch on Orders

With new orders for machine tools remaining at virtually the same level for three months, builders are anxious.

The big question: Will the current lull in sales be followed by an upswing in business or by a slump.—By E. J. Egan, Jr.

▪ The machine tool industry, like many others these days, is waiting for someone or something to spark an upturn in sales. During the last three months, the new-order trend line for metal cutting equipment has stayed horizontal.

The straight-line pattern started in September. Net new orders in that month totaled only $28.8 million. It was the first month in more than seven years that bookings failed to top the $30 million mark.

Levelling Good or Bad?—October's net new orders virtually repeated the September showing, adding up to $27.8 million. In November the total edged up to an estimated $28.4 million, neatly splitting the small September-October differential and emphasizing the horizontal trend.

Builders hope this level pattern might be a tip-off that the new order rate is going to start up again. On the other hand, they're wondering whether the current lull will stretch out still further, or worse yet, sag to even lower levels.

Backlogs Dropping—Meanwhile, shipments and backlogs keep dropping month by month. November shipments fell to an estimated $47.4 million, compared with $60.9 million in October and $81.7 million in November, 1956.

And the industry's average backlog at the end of November was estimated at 3.3 months by the National Machine Tool Builders' Assn. By contrast, the average builder had 6.7 months' work on hand at the end of November, 1956.

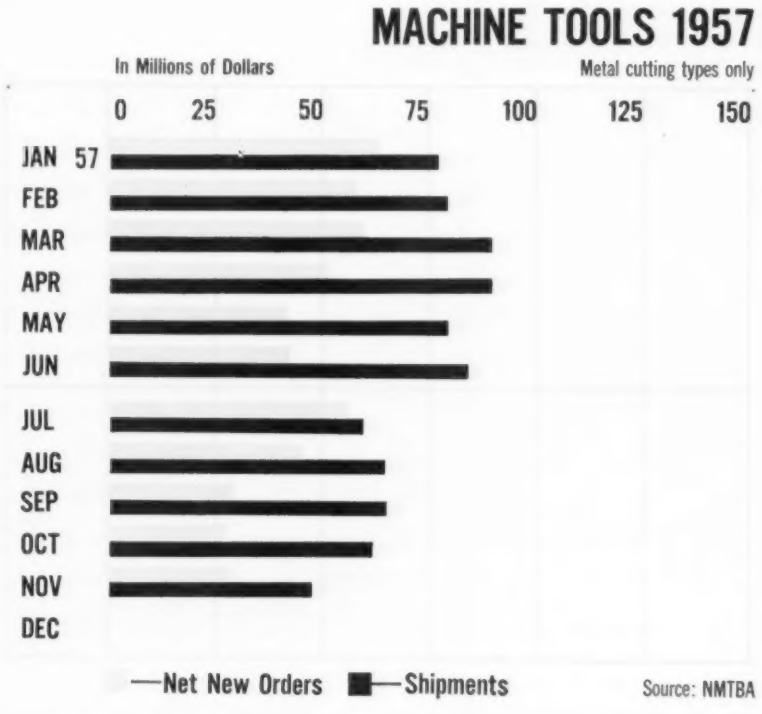
Although machine tools are as necessary to our way of life as bed sheets or wearing apparel, builders can't perk up business by running January White Sales or Semi-annual Clearances. They just have to sweat out whatever it is that's happening to the nation's economy.

Cutting Guide Ready

It makes no difference what anyone chooses to call a rose; one sniff and there can be no doubt in your mind. But it's not so simple when it comes to the nomenclature of cutting tools and their many elements. Names and descriptions vary considerably throughout industry.

To correct this situation, the Metal Cutting Institute has just published a 107-page book, "Metal Cutting Tool Nomenclature." Industry's adoption of the uniform terms and definitions it contains would eliminate many needless errors and delays in interpreting specifications.

Definitions, illustrations and nomenclature are arranged in separate sections for various classes of tools, such as twist drills, reamers, counterbores, taps, dies, milling cutters, gear generating tools and broaches. Priced at $4.50 per copy, the book is available only from the Metal Cutting Tool Institute, 405 Lexington Ave., New York 17, N. Y.



INDUSTRIAL BRIEFS

Good Casting — J. E. Borendame, director of marketing services, Acme Steel Co., Chicago, has been appointed chairman of the Program Committee for the National Industrial Advertisers Assn.'s 36th annual conference. Mr. Borendame is president of the Chicago Chapter of the NIAA for the 1957-58 term. He is also serving this year as president of the Chicago Chapter of Sales Promotion Executive Assn.

On the Team—The Double A Products Co. of Manchester, Mich., has joined the Brown & Sharpe Mfg. Co., Providence, R. I., as a wholly owned subsidiary. Operation of both Double A's valve manufacturing unit and Brown & Sharpe's pump facilities will continue as in the past. The transfer was in exchange for Brown & Sharpe voting stock.

Strictly Tools—LeMaire Tool & Mfg. Co., Dearborn, Mich., has changed its name to LeMaire Machine Tool Co. The change was made to reflect more accurately present activities. The company specializes in the manufacture of standard and special drilling, tapping and boring machines as well as automatic transfer machines and other high-production equipment for the automotive, implement and aircraft industries.

". . . and you're positive you've thoroughly checked the location of each salesman?"

More Vacuum Melting — The Utica Metals Div. of Kelsey-Hayes Co., will soon have added capacity with completion of a new plant. The facilities will make the division one of the large producers of vacuum melted alloys. The plant, affording 10,000 sq ft of floor space and costing in excess of $3 million, is located five miles southwest of Utica, N. Y. Full production is scheduled around March 1, 1958.

Wrap It Up — The Champion Paper & Fibre Co., Hamilton, O., has acquired half ownership of NRC Vaculite Corp. of Cambridge, Mass. The joint company will undertake a major program to commercialize a new vacuum metalized paper for packaging, building insulation and other applications. This product, embodying many of the characteristics of the metal foils familiar to the housewife, includes the advantages of inherently lower costs and greater versatility.

Headed South—U. S. Industries, Inc. plans to acquire the assets of Oil Field Sales & Service, S. A. The Venezuelan corporation distributes and services oil field equipment and tools in Venezuela and Colombia. Purchase price will be around $585,000. It will consist of 39,606 shares of USI common stock, with the balance to be paid in cash over a period of years out of future profits of Oil Field Sales & Service.

Tubes and Tubes—Superior Tube Co.'s new million-dollar plant in Wapakoneta, O., is now completely equipped and is in full production of small-diameter, cold-drawn tubing from .010-in. to .500-in. diameter and of cathodes for electron tubes. Begun in Jan. 1956, the plant has more than three times as much floor space as the leased facilities previously occupied on a nearby site. It has boosted by 30 pct the production capacity for small tubing and cathodes for east central and midwestern customers.

Half-Century Club—Barco Mfg. Co., Barrington, Ill., will celebrate the 50th anniversary of its founding this year. Fifty years represents growth from a 4-man second-story factory in Chicago, making a few brass products, to a 103,000-sq ft modern factory in Barrington. Today the company has a range of products of its own inventions and design. It serves the industry, railroads, the oil companies, commercial and military aviation and a substantial activity in the missile field.

Headed for Carolina—Pittsburgh Plate Glass Co. will build a large continuous fiber glass yarn plant at Shelby, N. C. A multi-million dollar plant, the new unit will employ about 850 persons at capacity operation. Construction work will get underway when contracts for utilities have been signed and options have been exercised on the plant site. The company holds options on about 135 acres of land in Cleveland County about six miles west of Shelby.

New England Outlet — A new Vanadium-Alloys Steel Co. warehouse has been completed near Springfield, at Agawam, Mass. A complete stock of high speed steels, die steels and tool steels for special purposes will be maintained in the warehouse in the form of bars, plate, sheet, circles and forgings. Specialty items carried in stock for immediate delivery will include drill rod, tool bits and precision ground flats and squares.

With a French Accent—Republic Aviation Corp. has formed a separate Helicopter Div. to handle sales, service and production of the Alouette II jet helicopter. Organization of the division followed completion of negotiations between the American company and Sud Aviation of France, designers of the Alouette. The division will be housed at Republic's Farmingdale, N. Y. plant. Flight testing will take place at the aircraft division's airfield in Farmingdale.

"We grind no axe . . . and really have no need to." After all, Bliss makes so many types and sizes of metalworking presses—actually many more than any other builder—that we favor only the one right press for your job. It may be a big one, a little one, a mechanical, a hydraulic, a standard or a special. But you can be sure it will be the *right* one.

If you have a pressed metal problem, isn't it logical to talk to a source that's certain to give you an impartial answer? To talk to Bliss?

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SINCE 1857

E. W. BLISS COMPANY · Canton, Ohio

100 years of making metal work for mankind

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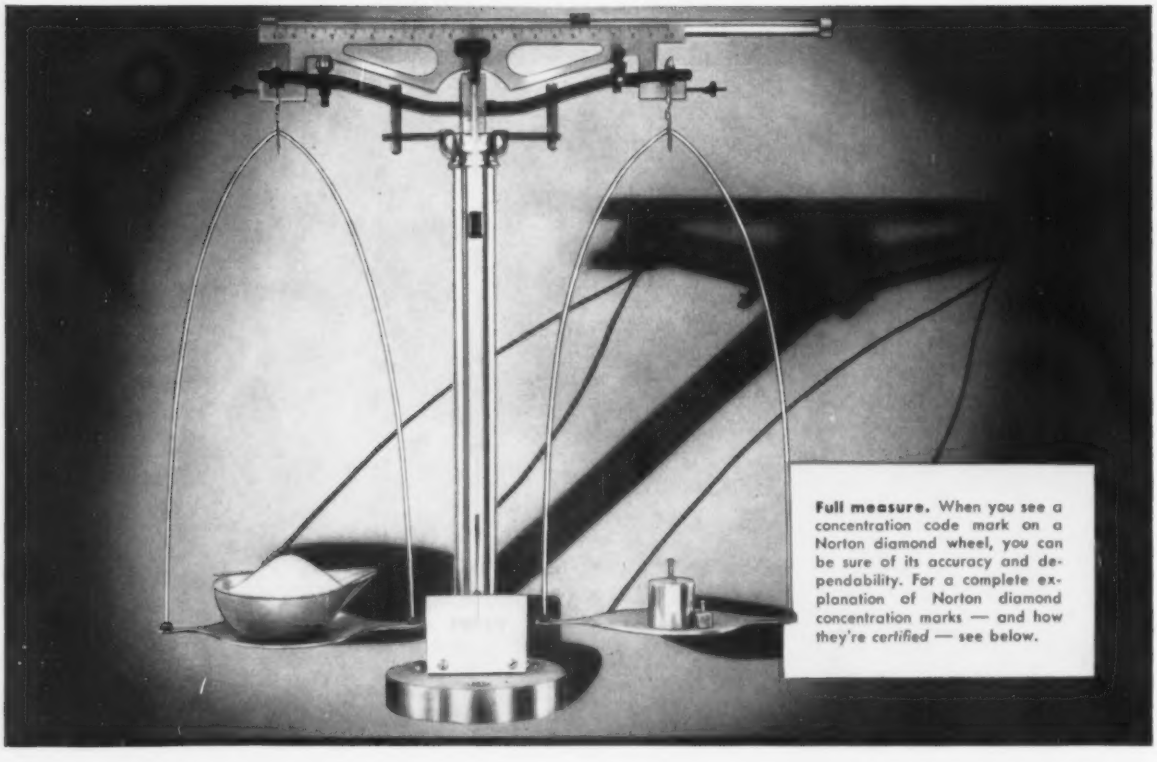


Full measure. When you see a concentration code mark on a Norton diamond wheel, you can be sure of its accuracy and dependability. For a complete explanation of Norton diamond concentration marks — and how they're *certified* — see below.

You get CERTIFIED DIAMOND CONCENTRATION with every Norton diamond wheel

Stamped on every Norton diamond wheel — or its container, in the case of various smaller wheels — you'll find a diamond concentration mark.

If the mark is 100, it means that each Norton 100 concentration diamond wheel contains an amount of diamond in carats calculated to a formula of 72 carats per cubic inch. Wheels of 75, 50 and 25 concentration of diamond contain 75%, 50% and 25% of this 100 concentration standard respectively.

The finished wheel contains the calculated number of carats of diamond except for the slight loss resulting from truing the diamond section to place the wheel in proper truth and condition for grinding.

Certified Accuracy

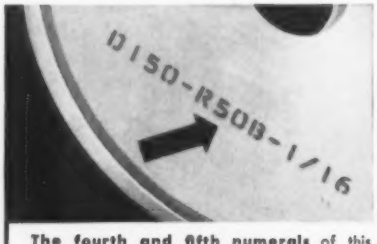
With each Norton diamond wheel you get a certificate of the accuracy of its diamond concentration, as marked. So, for your complete protection in diamond wheel buying, you can depend on this Norton marking to mean exactly what it says.

That's just one reason why it pays to buy Norton diamond wheels — made by the leader in diamond wheel development and manufacture. Norton was first to introduce all three types of diamond wheels — metal, resinoid and vitrified bonded . . . duplicates wheel specifications with constantly controlled accuracy . . . and does all its own sizing, grading and laboratory checking of diamond bort.

Your Norton Distributor

can give you prompt service on all types and sizes of diamond wheels. Or write to NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors all around the world.

W-1837



The fourth and fifth numerals of this Norton diamond wheel concentration mark are 50, as shown here. Make this and all other certified concentration marks on Norton diamond wheels your buying guide to better grinding at lower cost.

The complete line. Norton diamond wheels, the recognized "Crown Jewels" for value and performance, include sizes and types for every application, in every field — carbides, stone, glass, ceramics, electronics, etc.

NORTON ABRASIVES

Making better products . . . to make your products better

NORTON PRODUCTS Abrasives • Grinding Wheels • Grinding Machines • Refractories

BEHR-MANNING DIVISION Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

A. E. Ackerman, appointed vice president, sales, Millers Falls Co., Greenfield, Mass.

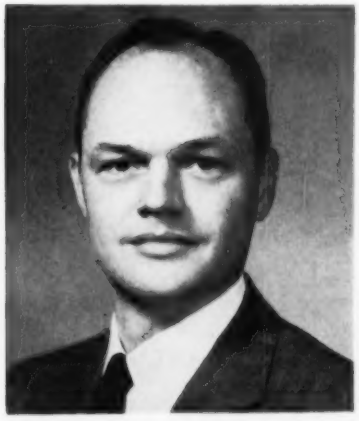
W. K. Sinclair, named vice president, sales, Super Steels, Inc., Cleveland.

R. H. Waddington, J. C. Parlee, R. A. Cabell and **Paul Queneau,** elected asst. vice presidents, The International Nickel Co. of Canada, Ltd.

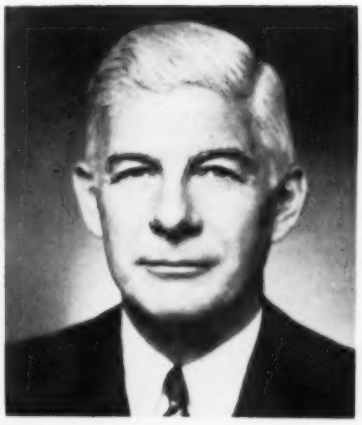
E. F. Martin, named vice president, steel operations, Bethlehem Steel Co., Bethlehem, Pa.

C. A. DuBois and **Louis Lerner,** elected president and executive vice president, respectively, DuBois Co., Inc., Cincinnati.

R. S. Huested, appointed manager, operations, Westinghouse Aviation Gas Turbine Div., Kansas City, Mo.



L. R. Payton, named head, Rigid Container Div., Reynolds Metals Co., Richmond, Va.



F. M. Huffman, named vice president, Traffic, Bethlehem Steel Co., Bethlehem, Pa.

R. J. Dervey, named president, Waterman-Waterbury Co. of Minneapolis.

A. W. Paull, Jr., elected president and treasurer, Wheeling Stamping Co., Wheeling, W. Va.

G. Q. Wales, becomes president, Brown - Wales Co., Cambridge, Mass.

B. E. Olsen, appointed asst. export manager, Kaiser Steel Corp., Oakland, Calif.; **E. M. Herold,** appointed asst. superintendent, roll shop, Fontana, Calif.

J. H. Morris, named asst. to the president, F. H. McGraw & Co., New York.

C. W. Sherman, appointed senior research associate, Jones & Laughlin Steel Corp., Pittsburgh.

E. N. Shutts, elected vice president, sales, Hartford Steel Ball Co., Inc., West Hartford, Conn.

J. J. Offutt, elected vice president, The A. P. Green Fire Brick Co.

R. W. McFall, named vice president, Litton Industries and general manager, Maryland Div.

C. B. Pharo, Jr., appointed manager, Birmingham district sales office, Republic Steel Corp.

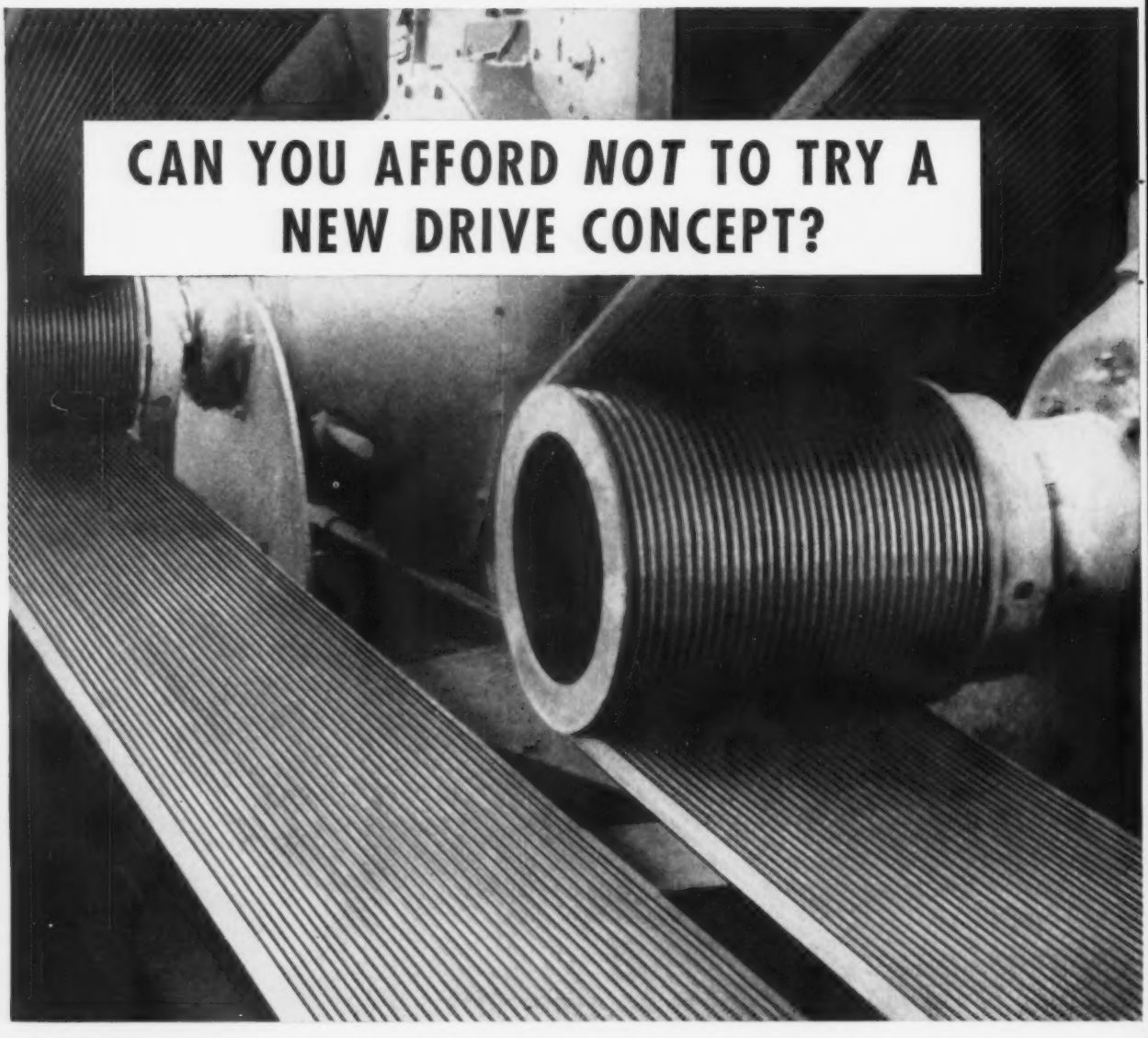
B. C. Harney, appointed sales manager, Bar Feed Div., Lipe-Rollway Corp., Syracuse, N. Y.

J. W. Kennedy, Jr., elected director, Copperweld Steel Co., Pittsburgh.

T. H. Kennevan, appointed sales manager, Union Supply Co.'s Homes Div., U. S. Steel Corp., Pittsburgh.

R. H. Tenuta, appointed asst. traffic manager, western area, American Steel & Wire Div., U. S. Steel Corp., Chicago.

N. F. Koepel, appointed asst. to the vice president, Chile Exploration Co. and Andes Copper Mining Co., subsidiary companies of The Anaconda Co., New York; **G. S.**



R/M Poly-V® Drive Delivers More Power in Less Space

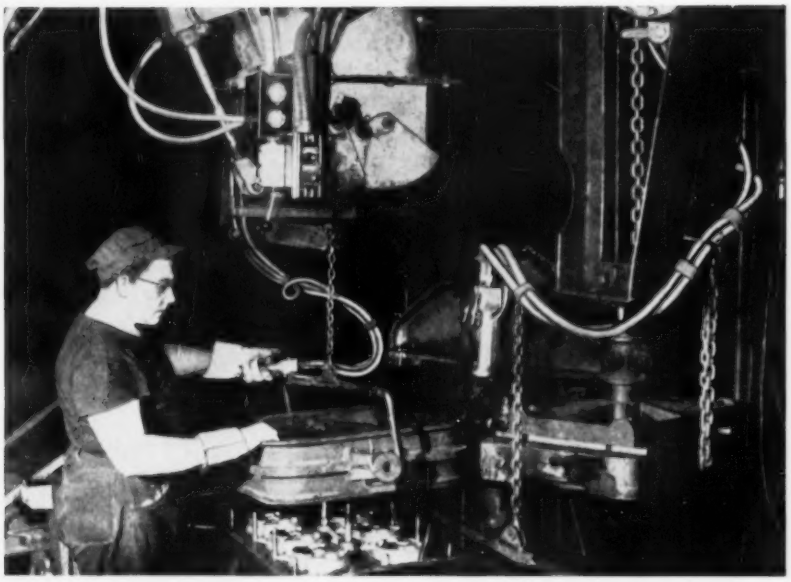
. . . "More Use per Dollar" for Your

Patented new design gives Poly-V Drive up to 50% more power capacity than a conventional V-drive of equal width . . . equal power in as little as 2/3 the width! Single unit V-ribbed belt permits *narrower drive sheaves . . . less shaft overhang . . . less drive weight.* Drive features add up to a new standard in trouble-free drive performance never before possible for heavy duty power driven equipment.

- Eliminates Multiple-Belt "Length Matching" Problems
- Maintains *Constant* Speed Ratios — *No* Load to *Full* Load
- Less wear on belt and sheaves
- *Two* Belt Cross Sections Meet *Every* Heavy Duty Power Requirement
- Reduces Belt *and* Sheave Inventories to a Minimum

Investigate advantages of *new* Poly-V* Drive for your application. Write for Bulletin #6638 . . . or discuss your requirements with an R/M representative.

*Poly-V is a registered Raybestos-Manhattan Trademark.



ALLFLEX HOSE — First hose of its type for all-purpose use with air, water, oil, gases—even mild chemicals. Strong, yet light and kinkless. Flexible, has no pre-set twist—coils and uncoils *in any direction*. Write for Bulletin #7075.

RAY-MAN CONVEYOR BELT — Double compensation relieves stress of outer plies, assures longer life for handling bulk materials. Tough, flexible, resists gouging and tearing. High fastener holding ability. Types available for heat, oil, static resistant use, package and table-top installations. Write for bulletins.

50% LESS OVERHANG For Less Drive Weight—Less Space.
PITCH
LINE
UNVARYING PITCH Diameter.
Poly-V cannot sink in the grooves under shock load.

RM614

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Wyman, named general manager; **R. C. Becker,** appointed resident manager, Chile Exploration Co. at Chuquicamata, Chile.

H. W. Brandt, appointed general manager, Kalamazoo Div., The New York Air Brake Co.

J. J. Morrissey, named general manager, General Drop Forge Corp., Buffalo, N. Y.

E. G. Hartmann, elected vice president, sales, John A. Roebling's Sons Corp.

W. E. Daily, appointed sales manager, Steel Tube Div., Southern Fabricating Co., Inc., Sheffield, Ala.

W. O. Buffe, appointed manager, sales, merchant wire products, and **F. B. Herschberger,** to manager, sales, industrial wire, Sheffield Div., Armco Steel Corp.

R. W. Gauss, promoted to asst. treasurer, Micromatic Hone Corp., Detroit.

J. M. Matthews, appointed director, sales, magnetic and electronic materials, Allegheny Ludlum Steel Corp., Pittsburgh.

R. A. Lubker, appointed director, research, Alan Wood Steel Co.

J. W. Rowan, appointed service manager, Detroit Aero Hydraulics Service Station, Vickers, Inc.

W. A. Surzik, named plant manager, and **N. E. Prochaska,** named manager, machine control systems, Cleveland Instrument Co., Cleveland.

G. C. Martin, appointed director, Technical Service Dept., Magnet Wire Div., Essex Wire Corp., Fort Wayne, Ind.

P. E. Bening, appointed sales manager, Thorsen Mfg. Co., Oakland, Calif.

Gerald Carlisle, elected secretary, Micromatic Hone Corp., Detroit.

D. H. Nelson, promoted to asst. manager, Becco Chemical Div., Food Machinery and Chemical Corp., Buffalo, N. Y.

F. E. Sisk and **W. N. Mullen,** appointed district sales managers, Rockwell Mfg. Co.'s Delta Power Tool Div.

G. C. Condon, appointed chief accountant, Trenton, N. J. Works, American Steel & Wire Div., U. S. Steel Corp.

J. W. McCue, appointed field engineer, Indianapolis district office, Norton Co., Worcester, Mass.

H. T. Dryer, appointed applications engineer and supervisor, Applied Research Laboratories Demonstration Center, Dearborn, Mich.

E. A. Ross, named vice president, industrial relations, Weirton Steel Co.

Hill Pierce, appointed field engineer, Detroit area, Baker Brothers Inc., Toledo, O.

J. H. Dasdorf and **W. A. Hammer,** appointed metallurgical engineers, Earle M. Jorgensen Co.

A. C. Ekberg, named district manager, Detroit office, Pratt & Whitney Co., West Hartford, Conn.

Following appointments are within the Marketing Dept. of Latrobe Steel Co., Latrobe, Pa. **J. L. Wandrisco,** named manager, mar-

a moment

with management . . .

"SCRAP" versus "YIELD"

Testing is a way to **reduce scrap**—also to **increase yield.** In cold arithmetic the two might seem identical, but the yield concept is proving far more effective as a management tool.

As a human factor, it is one thing to drive scrap or rework losses down from 5 percent to 2 percent. It is something else to boost yield up from 95 percent to 98 percent.

The yield yardstick rates men by their positive accomplishments rather than by their shortcomings. It works better, just as "more touchdowns" is a better slogan than "fewer fumbles."

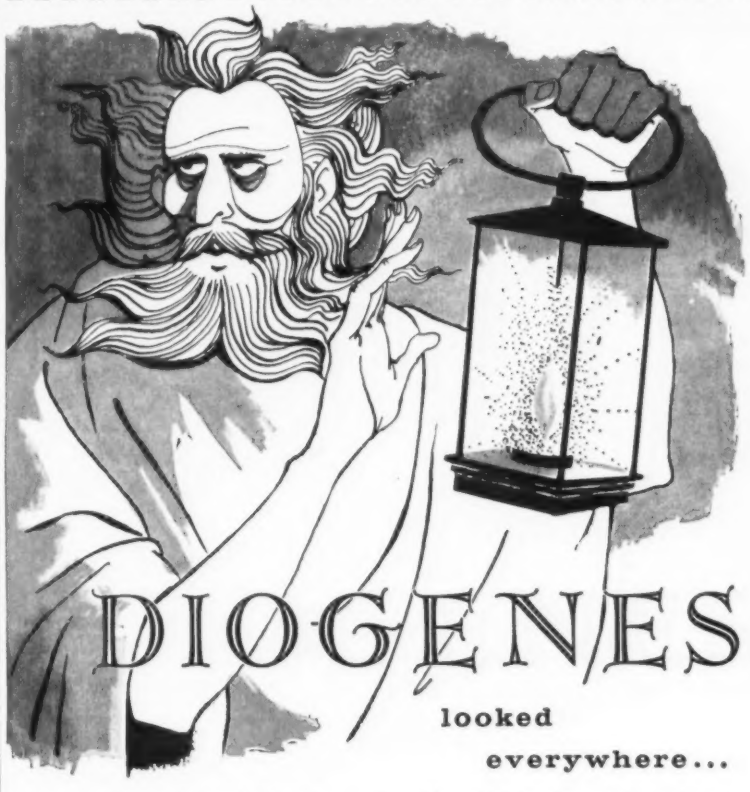
The positive standard is more in tune with the American tradition. It substitutes a friendly executive challenge for an implied criticism. It generates more enthusiasm for results.

But it often does much more than that. Testing used to increase yield is like adding new production machines that you never have to pay for. When your machines and men can spend their time working only on known good parts, their total yield goes up by the sum of the time otherwise spent on parts that would be scrapped. Even if your net scrap remains the same (usually it drops, because you find the reasons for it) your increased yield gives you a broader base for all your marketing operations.

So testing is a direct way to build better business profits.

That is why management is increasingly turning from percentage SCRAP to percentage YIELD as the yardstick to rate production and testing accomplishment.

Why not toss the idea on the table at the next plant meeting?



Lamp in hand, Diogenes tramped barefooted through the streets of Athens looking, he said, for a truly honest man. There must have been many relatively good men and true in old Athens. The trouble was probably with Diogenes. Like many of us, he aimed for perfection and just set his standards too high.

Today, many manufacturers find themselves in a like fix.

In their zeal to make an honest product, they frequently reject parts and materials that would be perfectly good for their purposes. Why? Because they reject for *seeming* defects. Or, they toss out bad parts far too late,—*after* much production time and labor have been spent on them.

In either case, these men rob themselves of legitimate profit through unnecessary high cost.

Magnaflux nondestructive test systems are in wide use, as a means of controlling production costs and quality. They make defects visible or show incorrect material characteristics or composition—at any stage of the production processes. Such early detection permits rapid correction of small troubles before they become big and expensive.

If you would shed light on how Magnaflux Test Methods could help improve your production operations, write for your copy of "LOWER MANUFACTURING COSTS". This new booklet clearly illustrates where and how these production tools have helped others. They can do the same for you.

Test equipment by Magnaflux can be tailored to your exact needs. Prices vary from a few hundred to a few thousand dollars—outright sale, no rentals required.

Moral: A little light can uncover a problem...a little thought can suggest a cure.

To Test is to Economize

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Take Your Inspection Problems to the House of Answers . . .

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NOW YOU CAN ASSEMBLE your own Herc-Alloy sling chains. No more waiting for new or rebuilt assemblies to reach you from the factory. With all components supplied by your Herc-Alloy Distributor, you can do the job yourself in minutes. Call your CM Chain Distributor today for details.

DO-IT-YOURSELF. The Hammerlok Coupling Link frees you from the traditional time lag in the procurement of sling chains. With Hammerlok, anyone who can drive a nail can assemble or rebuild a sling chain in minutes. No peening! No welding! Hammerlok is rugged...reusable...safe. Endorsed by leading alloy chain users.

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CM HOISTS AND CHAIN

HERC-ALLOY® HAMMERLOK®

keting; **R. A. Ferguson,** appointed manager, sales promotion.

Robert Jacobson, appointed director of purchases, Reading Metals Refinery Corp., subsidiary of Reading Tube Corp., New York.

M. B. Draper, appointed general superintendent, Wallingford, Conn., steel service plant, Joseph T. Ryerson & Son, Inc.

Philip DiFalco, named chief engineer, LeMaire Tool & Mfg. Co.

J. F. Donnelly, appointed director, technical sales training, All-State Welding Alloys Co., Inc., White Plains, N. Y.

R. N. Conner, named Southwestern district manager, Baldwin-Lima-Hamilton Corp.

D. W. Schluter, appointed district sales manager, New York and New England territories, Tubular Rivet & Stud Co., Wollaston, Mass.

HARSHAW

Production-Controlled High-Quality

FLUORIDES

Boron Trifluoride
Hydrofluoric Acid

ANHYDROUS . . . AQUEOUS

The uses for Fluorides are ever increasing. Harshaw Fluoride production also has increased steadily. Shipments of cylinders and tank cars leave our plant daily. If required, you are invited to draw on the knowledge and experience of our staff of technical specialists on Fluorides.

Write for your free copy of M.C.A. Chemical Safety Data Sheet SD-25 on properties and essential information about . . .
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Anhydrous and Aqueous

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Hastings-On-Hudson, N.Y. • Houston
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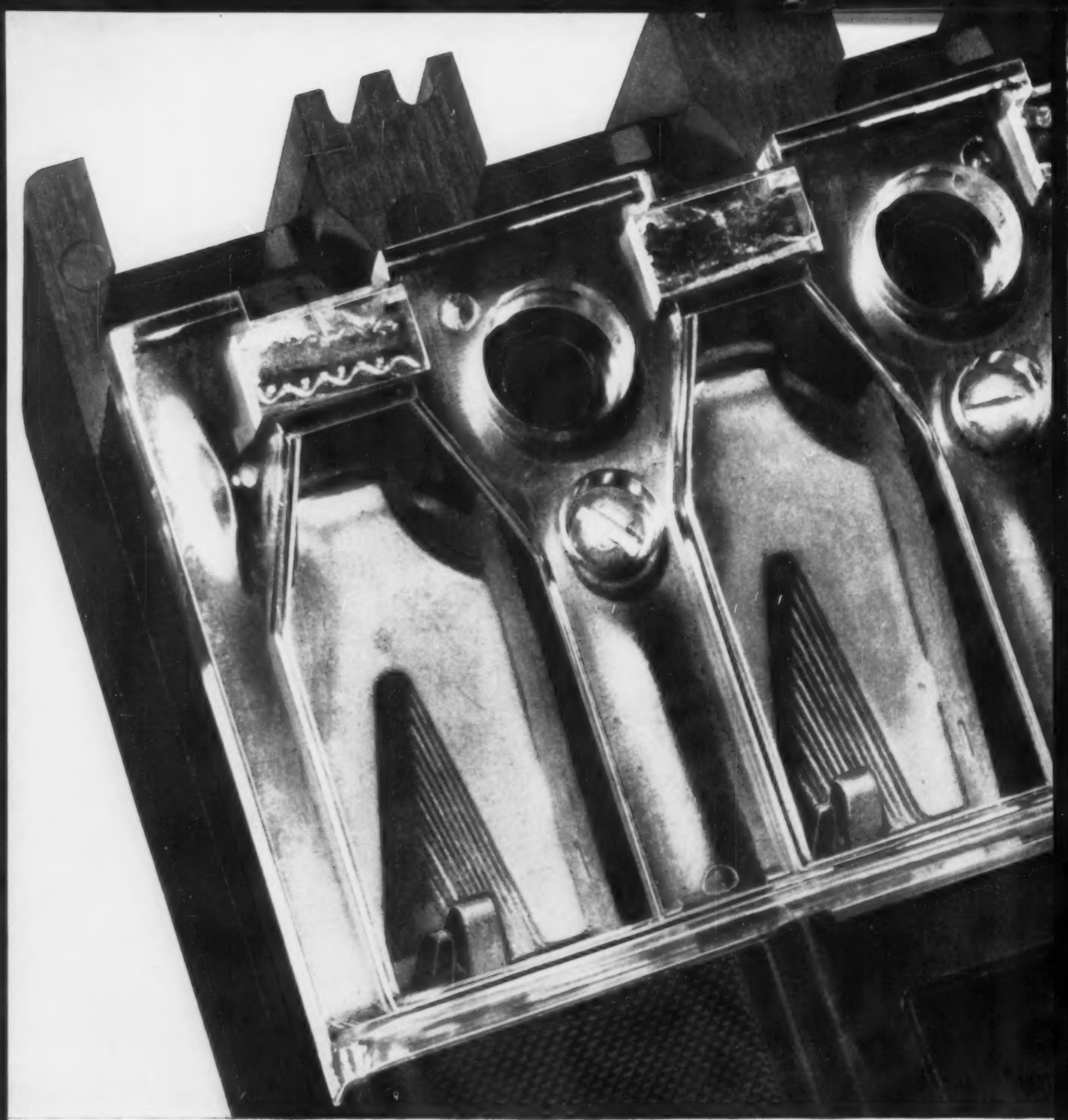
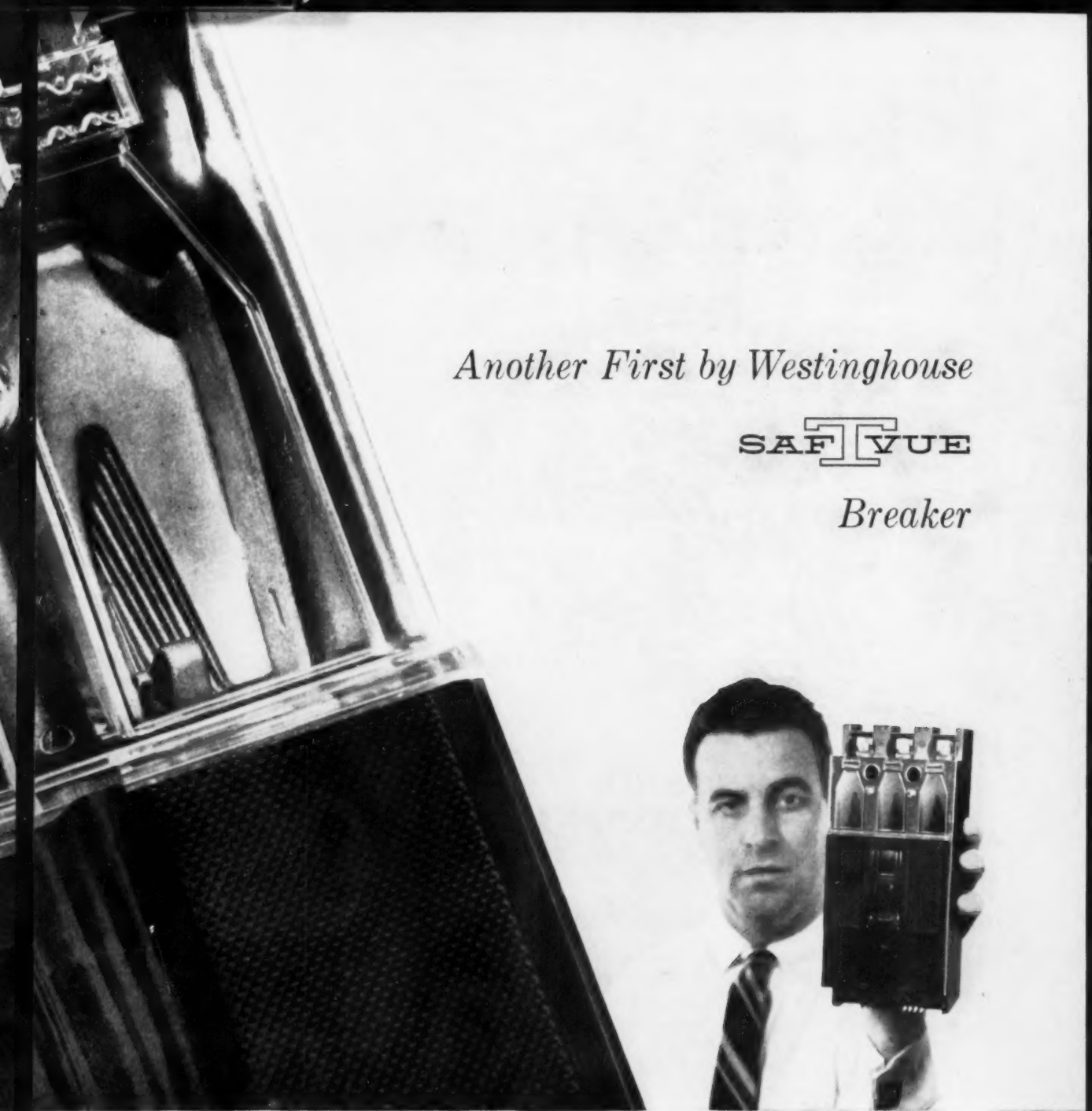
Here is a helpful list of HARSHAW production-controlled high-quality fluorides:

Ammonium Bifluoride
Ammonium Fluoborate
Antimony Trifluoride Sublimed
Barium Fluoride
Bismuth Fluoride
Boron Trifluoride
Boron Trifluoride Complexes
Chromium Fluoride
Copper Fluoborate
Fluoboric Acid
Fluorine Cells
Fluorinating Agents
Frosting Mixtures
Hydrofluoric Acid Anhydrous
Hydrofluoric Acid Aqueous
Hydrofluosilicic Acid
Lead Fluoborate
Metallic Fluoborates
Potassium Bifluoride
Potassium Chromium Fluoride
Potassium Fluoborate
Potassium Fluoride
Potassium Titanium Fluoride
Silico Fluorides
Sodium Fluoborate
Tin Fluoborate
Zinc Fluoborate
Zinc Fluoride



World's First Breaker with the Contacts VISIBLE



Another First by Westinghouse

SAF-T-VUE

Breaker

Everyone who's seen this exciting new development has said "this is the biggest thing in circuit protection since the development of breakers . . . you're sure the contacts are open (or closed) because you can see through the transparent window."

Of course they're right, and in addition, Westinghouse Saf-T-Vue Breakers have the positive action, tested accuracy, long life and special features that engineers, manufacturers, electricians and contractors have depended upon for years. Now plants whose safety codes require that contacts be visible can use the most modern form of circuit protection.

See your Westinghouse representative, or write Westinghouse Electric Corporation, Standard Control Division, Beaver, Pennsylvania. J-30286

YOU CAN BE SURE...IF IT'S Westinghouse

SIMONDS SPECIAL PARTS DIVISION

can make them for you

If you're looking for a dependable source of hardened and ground FLAT STEEL PARTS . . . especially those that require a fine finish and close tolerances . . . then Simonds is your answer.

Simonds Special Parts Division offers you a complete service — from steel of any desired analysis made in our Steel Mill in Lockport, N. Y., to fabrication in our famous Controlled Conditions Plant in Fitchburg, Mass.

Simonds Special Parts Division is fully equipped to produce precision ground, heat treated flat steel parts in any quantity for aircraft engines, printing presses, slitting machines, air compressors and numerous other applications. Clutch, valve and engine discs, spacer rings, slide bars, washers and die plates are other Special Parts Division items. Send inquiries, with full specifications or blueprints, to your nearest Simonds Factory Branch.

Get all these — and more—from SIMONDS

- Heat Treated Discs — all types
- Valve Discs (Compressors)
- Clutch Discs (Multiple Disc Type)
- Aircraft Engine Discs
- Machine Parts (Flat Steel)
- Wear Plates (Ways, etc.)
- Blades — all types — plain — toothed — beveled (for cutting or scraping)
- Circular Cutters for all types of cutting
- Irregular Shaped Cutters — all types
- Heat Treated Liner Plates
- Rectangular Plates — all types

Factory Branches in Boston, Chicago, Shreveport, La., San Francisco and Portland, Oregon
Canadian Factory in Montreal, Que., Simonds Divisions: Simonds Steel Mill, Lockport, N. Y.
Heller Tool Co., Newcomerstown, Ohio, Simonds Abrasive Co., Phila., Pa., and Arvida, Que., Canada

SIMONDS
SAW AND STEEL CO.
FITCHBURG, MASS.

How Good Are Leaded Steels in Fatigue?

By **G. W. Brock**—Research Associate
and **G. M. Sinclair**—Professor, Dept. of Theoretical and Applied Mechanics,
University of Illinois, Urbana, Ill.

When it comes to vital mechanical properties, where do leaded steels stand? There have been few definite answers to this question—until now.

If you're using leaded steels—or plan to use them—this article should prove helpful.

■ The advantages of leaded steels are well known. Primarily, they consist of better machinability—along with less power consumption, longer tool life, and a better surface finish.

But what about the mechanical properties of leaded steels—especially their tensile and fatigue properties? Are they entirely comparable to non-leaded grades or somehow different?

These questions have now been answered quantitatively, thanks to a recent test program conducted at the Dept. of Theoretical and Applied Mechanics, University of Illinois, and sponsored by the Navy Bureau of Ordnance.

The answers: Tensile and ductil-

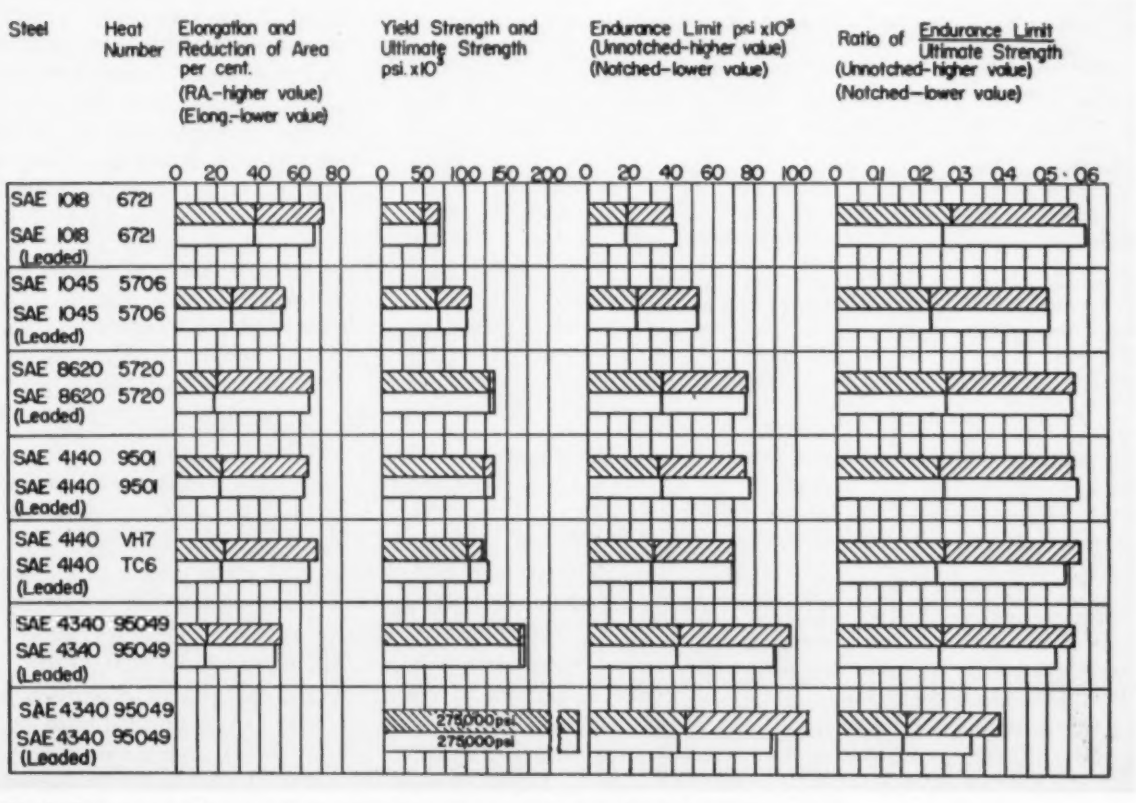

Steel
Heat Number
Elongation and Reduction of Area per cent. (RA.–higher value) (Elong.–lower value)
Yield Strength and Ultimate Strength psi. x10³
Endurance Limit psi x10³ (Unnotched–higher value) (Notched–lower value)
Ratio of Endurance Limit / Ultimate Strength (Unnotched–higher value) (Notched–lower value)
0 20 40 60 80
0 50 100 150 200
0 20 40 60 80 100
0 01 02 03 04 05 06
SAE 1018 6721
SAE 1018 6721 (Leaded)
SAE 1045 5706
SAE 1045 5706 (Leaded)
SAE 8620 5720
SAE 8620 5720 (Leaded)
SAE 4140 9501
SAE 4140 9501 (Leaded)
SAE 4140 VH7
SAE 4140 TC6 (Leaded)
SAE 4340 95049
SAE 4340 95049 (Leaded)
SAE 4340 95049
SAE 4340 95049 (Leaded)
275000psi
275000psi

FIG. 1: Summary of test results for leaded and non-leaded steels of five types.

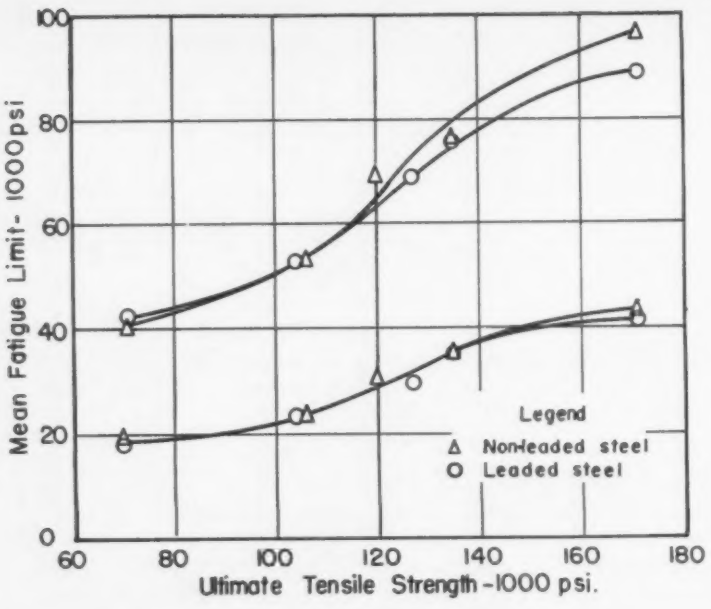


FIG. 2: The fatigue strength of leaded and non-leaded steels is plotted as a function of tensile strength.

TABLE 1

Chemical Analyses of Leaded and Non-Leaded Steels Tested

Grade	Heat No.	C	Mn	P	S	Si	Cr	Ni	Mo	Pb	Supplier
SAE 1018	6721	.19	.84	.015	.030	.24					Inland
SAE 1018	6721	.19	.84	.015	.030	.24				.20	Inland
SAE 1045	5706	.48	.86	.015	.026	.25					Inland
SAE 1045	5706	.48	.86	.015	.026	.25				.19	Inland
SAE 8620	5720	.20	.77	.014	.027	.30	.53	.56	.18		Inland
SAE 8620	5720	.20	.77	.014	.027	.30	.53	.56	.18	.20	Inland
SAE 4140	9501	.41	.92	.014	.022	.32	.96		.17		Inland
SAE 4140	9501	.41	.92	.014	.022	.32	.96		.17	.19	Inland
SAE 4140	VH7	.38	.77	.016	.026	.23	.92		.21		Ryerson
SAE 4140	TC6	.40	.90	.016	.027	.32	.90		.18	.21	Ryerson
SAE 4340	95049	.41	.77	.013	.031	.28	.71	1.75	.22		Copperweld
SAE 4340	95049	.41	.77	.013	.031	.28	.71	1.75	.22	.18	Copperweld

ity values for leaded steels may be reduced slightly at all strength levels. The reduction is so slight as to be of little practical significance.

Within Limits—Of more significance is the fact that lead content does reduce the limiting fatigue stress of standard specimens at all tensile levels tested. This effect is small at 125,000 psi and below. It increases with an increase in tensile strength. No measurable effect on the values of limiting fatigue stress was noted for notched test specimens.

Fatigue ratio decreases with increasing tensile strength regardless of the quality of the steel and the absence or presence of lead or a stress raiser. In the steels tested, the addition of lead reduced notch sensitivity. In the presence of a notch, there is practically no difference between the fatigue strengths of leaded and non-leaded steels.

Stress Raisers—If you're not too familiar with leaded steels, you might be puzzled by this special concern about mechanical properties. It stems from the knowledge that lead is virtually insoluable in steel at room temperatures. For this reason, it can be expected to be present in small globules or stringers. If these inclusions act as stress raisers, they can be expected to cause a lowering of fatigue strength.

It is fairly well established that lead has little effect on the tensile properties of alloy steels. It may cause a slight drop in ductility and impact strength. But neither loss is likely to be at all serious. Still, there is the question of the fatigue properties of these steels when they are used for parts subjected to alternating loads.

Mostly Fatigue — With this in mind, the Illinois test program purposely concentrated on obtaining fatigue results. Five types of steels (both leaded and non-leaded) were heat treated to certain strength levels. Tests were then run to determine the effect of lead additions on fatigue strength. Tensile tests were also run for the same steels.

The chemical analyses of the various heats of the five grades of steel tested are shown in Table 1. The practical significance of the tests is highlighted by the fact that all of these grades are widely used in industry. Note that in almost every case both leaded and non-leaded specimens were obtained from the same basic heat.

Sample Bars—Two heats (VH7 and TC6) were obtained from commercially available stock and were supplied as 9/16 in. diam cold rolled rod. The remaining varieties of each grade were cast as ingots 27¾ in. square. The middle two-thirds of each ingot was used for hot rolling into ½ in. diam rod.

The steel was cut up into 3⅛ in. lengths and heat treated in an electric furnace. Specimens of leaded and non-leaded steel from the same heat were intimately mixed inside

the furnace to guarantee similar heat treatment.

Different Tempers — The 4140 from separate heats was tempered at slightly different temperatures to try to obtain similar mechanical properties in the leaded and non-leaded batches. Details of all heat treatments are listed in Table 2.

With SAE 1018, it was found that the leaded steel showed slightly superior fatigue properties on smooth specimens. The confidence limits of the mean fatigue limit fell above those of the non-leaded variety. Results indicate the mean fatigue limits as 42,400 psi and 40,850 psi for the leaded and non-leaded grades.

Slightly Better—A comparison of the mean fatigue life at 45,000, 50,000, and 55,000 psi, gives an increase in mean life at all these stresses for the leaded steel. However, the confidence limits for both steels overlap at 45,000 psi, so it is only possible to say that the leaded steel is slightly superior at 50,000 and 55,000 psi. On the basis of mean fatigue life, the increase amounts to about 30 pct.

The confidence limits of the notched bar mean fatigue limits for the two steels overlap. Within the limits of the results, no distinction can be made between the two steels.

No Distinction—In the case of SAE 1045, the mean fatigue limits of the smooth and notched specimens, respectively, are 53,350 and 23,550 psi for the non-leaded steel. The same values for the leaded steel are 52,900 and 23,300 psi. Again, the 95 pct confidence limits on the mean fatigue limits overlap. So that within the limits of the tests, no distinction can be drawn as to which steel has superior fatigue properties.

The mean fatigue limits of the smooth and notched specimens of SAE 8620 are 76,650 and 35,650 psi for the non-leaded steel. Values for the leaded steel are 75,650 and 35,350 psi. Here, too, the 95 pct confidence limits overlap.

The mean fatigue limits of smooth and notched specimens of SAE 4140 drawn from the same heat are 75,800 and 33,000 psi for the non-leaded steel and 77,500 and 33,350 psi for the leaded steel. Overlapping of the 95 pct confidence limits also occurs with these grades.

Fatigue Ratio—The 4140 steels obtained from separate heats proved to have ultimate strength that differed slightly due to their different compositions. For this reason, their fatigue properties are best compared using the fatigue ratio—the ratio of mean fatigue limit to ultimate strength.

The fatigue ratio of smooth and notched specimens of non-leaded steel checks out at 0.58 and 0.256, respectively. Values for leaded steel are 0.542 and 0.235. The 95 pct confidence limits for the smooth specimens are separate and suggest that the leaded steel has inferior fatigue properties amounting to about a 6 pct decrease on a comparison of the mean fatigue ratio.

Overall Average — However, if the results obtained with this leaded steel are compared with those obtained on the 4140 non-leaded steel from Heat No. 9501, the confidence limits overlap. This suggests that perhaps on an overall average of different heats the performance of leaded and non-leaded steel in this hardness range would not be significantly different.

With SAE 4340, values of the mean fatigue limit for the smooth and notched specimens are 96,650 and 43,150 psi, respectively, for the non-leaded steel and 88,950 and 4,550 psi for the leaded steel.

Slight Drop — The confidence limits on the smooth specimens are distinctly separate. The fall in fatigue properties of the leaded steel is definite and represents a drop of approximately 8 pct on the mean fatigue limit. The confidence limits for the notched specimens overlap, so that there is no apparent difference between the two steels.

The fatigue results for 4340 tested at 275,000 psi ultimate strength gave values of the mean fatigue limit for smooth and notched specimens of 105,000 and 45,750 psi, respectively, for the non-leaded

TABLE 2

Heat Treatment of Steels Tested

C1018	As rolled condition
C1018 (Leaded)	
C1045	Austenitized at 1650 F for ½ hour and air cooled
C1045 (Leaded)	
8620	Normalized at 1600 F for ½ hour
8620 (Leaded)	Austenitized at 1550 for ½ hour; water quenched and tempered at 1030 F for 1 hour
4140 (Heat No. VH7)	Austenitized at 1550 F for 1 hour, oil quenched and tempered at 1230 F for 1 hour
4140 (Leaded) (Heat No. TC 6)	Austenitized at 1550 F for 1 hour, oil quenched and tempered at 1250 for 1 hour
4140 (Heat No. 9501)	Normalized at 1600 F for 1 hour
4140 (Leaded) (Heat No. 9501)	Austenitized at 1550 F for 1 hour, quenched in oil and tempered at 1200 F for 1 hour
4340	Normalized at 1600 F for 1 hour
4340 (Leaded)	Austenitized at 1525 F for 1 hour, oil quenched, and tempered at 975 F for 1 hour
4340	Normalized at 1600 F for 1 hour
4340 (Leaded)	Austenitized at 1475 F for 1 hour in salt bath, oil quenched, and tempered at 450 F for 2 hours

TABLE 3 **Results of fatigue tests on smooth and notched specimens of leaded and non leaded steel.**

Steel	Heat No	Type of Specimen		Mean Fatigue Limit. psi.	Standard Deviation psi.	95% Confidence Limits on the Mean. psi.	
						Upper	Lower
SAE 1018	6721	Smooth Bar	Non Leaded	40,850	1,430	41,700	40,000
			Leaded	42,400	530	42,750	42,000
		Notched Bar	Non Leaded	19,500	3,640	21,450	17,550
			Leaded	18,100	1,940	19,200	17,050
SAE 1045	5706	Smooth Bar	Non Leaded	53,350	680	54,000	52,650
			Leaded	52,900	3,720	54,950	50,900
		Notched Bar	Non Leaded	23,550	1,100	24,300	22,800
			Leaded	23,300	1,460	24,250	22,350
SAE 8620	5720	Smooth Bar	Non Leaded	76,650	4,600	79,300	74,050
			Leaded	75,650	1,080	76,350	75,000
		Notched Bar	Non Leaded	35,650	1,350	36,450	34,850
			Leaded	35,350	1,080	36,000	34,650
SAE 4140	9501	Smooth Bar	Non Leaded	75,800	7,310	80,100	71,500
			Leaded	77,500	1,680	78,500	76,500
		Notched Bar	Non Leaded	33,000	2,250	34,250	31,750
			Leaded	34,350	1,080	35,000	33,650
SAE 4140	VH7 TC6 VH7 TC6	Smooth Bar	Non Leaded	69,600	1,690	70,600	68,550
			Leaded	68,950	3,130	70,700	67,200
		Notched Bar	Non Leaded	30,800	2,020	32,000	29,650
			Leaded	29,800	5,170	32,600	27,000
SAE 4340	95049 (171,000psi) Ult. Strength	Smooth Bar	Non Leaded	96,650	2,030	97,850	95,500
			Leaded	88,950	1,780	90,000	87,900
		Notched Bar	Non Leaded	43,150	1,400	44,000	42,350
			Leaded	41,550	5,550	44,800	38,250
	(275,000psi) Ult. Strength	Smooth Bar	Non Leaded	105,000	7,940	109,500	100,600
			Leaded	88,000	4,560	90,500	85,500
		Notched Bar	Non Leaded	45,750	2,380	47,200	44,300
			Leaded	42,590	3,380	44,450	40,700

steel. Leaded steel showed values of 88,000 and 42,590 psi.

4340 Results — The confidence limits on the smooth specimens are far apart. Thus a fall in fatigue properties of the leaded steel is assured and represents a drop of about 16 pct on the mean fatigue limit.

The confidence limits for the notched specimens just barely overlap, so that the difference between the mean fatigue limits of 45,750 psi for the non-leaded steel and 42,590 for the leaded steel may be due to chance. If this were not a chance result, the drop in the mean fatigue limit would be about 7 pct.

In Fig. 2 are shown the values of the mean fatigue strengths obtained at various ultimate tensile strengths for both leaded and non-leaded steels.

Tensile Counts—Based on this chart, it appears that ultimate tensile strength is the significant variable in determining the influence of lead on fatigue strength. Below an ultimate strength level of 130,000 psi, lead appears to have little effect on the fatigue properties of smooth specimens. Above this strength level, the fatigue values for leaded steel begin to deviate and drop below the values for non-leaded steel.

This same chart shows a drop in the fatigue strength of smooth specimens in the upper tensile range. Notched bar strength is evidently not affected to quite the same degree.

The general trend seems to indicate that the fatigue strength of leaded steel drops below that of non-leaded steel at about 135,000 psi. The gap between the two steels widens until a 16 to 20 pct decrease in mean fatigue limit is reached at the higher ultimate strengths.

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Low-Cost Film Bonds Sandwich Units

Do production bonding techniques always require costly application units?

The answer's no, with adhesive in film form. The film has made a name for itself in bonding flat materials.

What's more, a new adhesive carrier permits a thinner film at lower cost with choice of application method.

▪ A new film adhesive incorporates high-strength porous paper as the carrier for latent adhesive. The low-cost elastomer-phenolic adhesive bonds flat metal sheet and plastic film to metals and plastics.

Produced by Rubber and Asbestos Corp., Bloomfield, N. J., the adhesive, called Plymaster V-3, has a film thickness of 4 mils. This contrasts with the 11-mil thickness of the company's Plymaster V-2 film with a glass mat carrier. For all the advantage of less weight and lower cost, the V-3 film suffers only a slight loss of physical properties.

Solvent-Free — Because the film is solvent-free, the bonding operation is clean with adhesive confined primarily to bonding areas. In addition to speeding production, the film gets uniform bond thickness. For most applications there's no handling of liquids.

Packed in fiber containers the film comes in 100-yd rolls 36 in. wide. A polyethylene interliner prevents blocking in transit and storage. Shelf life for the film is about 6 months from the date of manufacture.

Application Techniques—Whatever method is used, the first step is to clean, degrease, and dry metal surfaces. For rigid plastics, it calls for removal of mold release and a light sanding.

There's a choice of four methods to reactivate the adhesive, depending on materials and end-use. For example, thin films or foils will almost always fail or distort before the bond will give, regardless of method used.

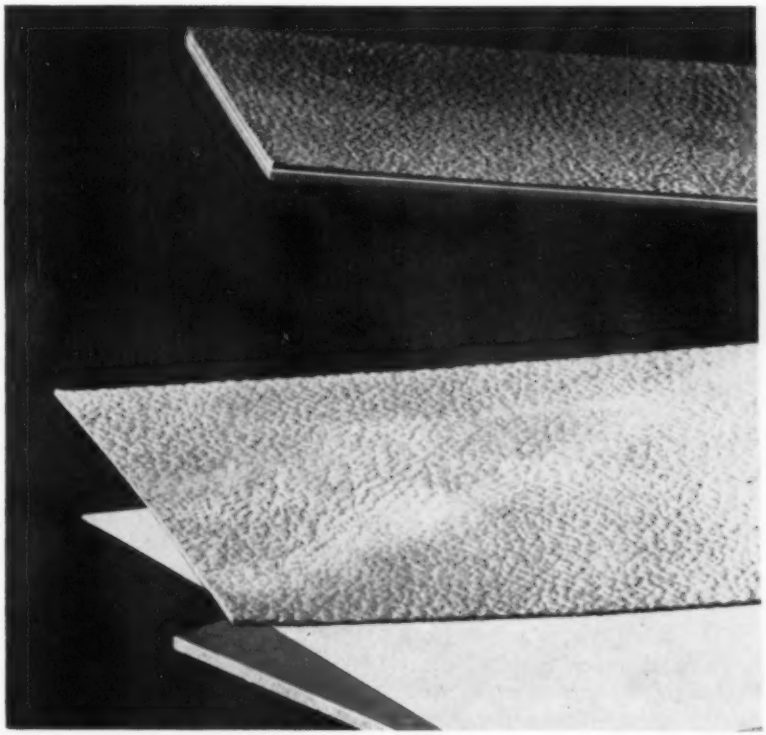
"Structural" strengths are achieved with heat curing. Take the case of interior aircraft bulkheads: A heat curing under pressure bonds aluminum faces to impregnated paper honeycomb cores.

For Maximum Strength — The technique for maximum bond strength specifies application of liquid adhesive to both adherent surfaces at about 0.03 lb per sq ft, allowing it to dry. The film should also be primed and allowed to dry. The assembled sandwich is then put under 50-psi pressure and heat cured at 315°±5°F for 20 minutes.

With V-2 film, this method gets tensile shear strengths of 1800 to 2000 psi on rigid metal bonds with peel strengths over 25 lb per in. The V-3 film gets about 20 pct less in strength values.

The most popular solvent for reactivating the adhesive is MEK (methyl ethyl ketone). Where large areas need a "slower-working" solvent, MIBK (methyl isobutyl ketone) does the job.

For non-flammable and relatively non-toxic conditions, the company suggests a mixture of 55 parts by liquid volume of bromochloromethane and 45 parts of MEK.



IDEAL FOR SANDWICH: Film adhesive bonds vinyl sheeting to aluminum and rigid phenolic board.

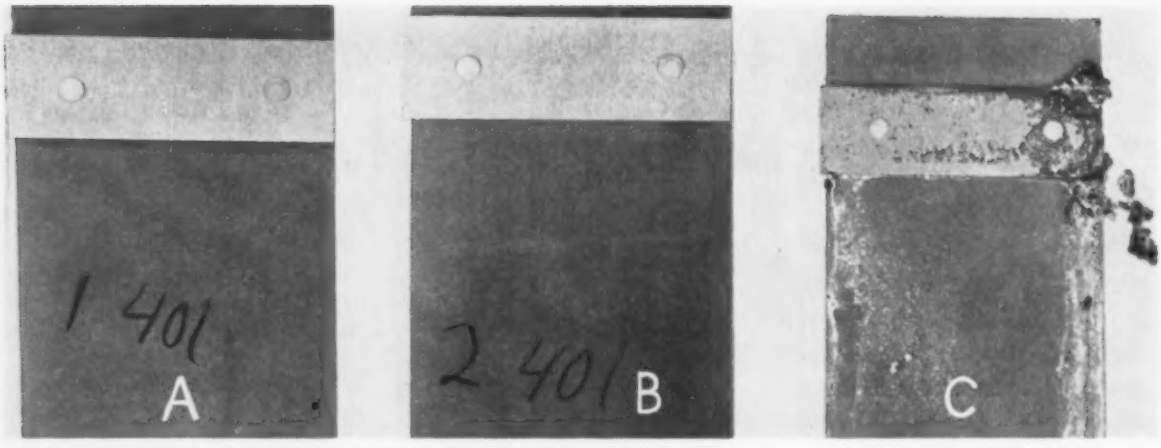


FIG. 1: Panel A has one coat of PT 401 and panel B has two coats, while panel C received two coats of zinc chromate and two of lacquer. This is how A and B looked after 189 hours in salt spray, and panel C after 141 hours. Cross pieces riveted to each panel are aluminum anodized with chromic acid.

New Coating Gives Magnesium

Use of magnesium is spreading rapidly in structures and components which might encounter highly abrasive and corrosive conditions.

The need for extra protection has already been experienced in missiles; and there's a coating system that meets the test.

▪ With demand growing for lighter-weight high strength metals, industry is turning more and more to magnesium. Its high strength-to-weight ratio is solving countless weight problems in virtually every field, and especially on aircraft and missiles.

In some applications it's necessary to protect magnesium against abrasion, corrosives such as salt air and certain acids, and galvanic corrosion when it's coupled with dissimilar metals.

This isn't always easy. Hard, oven-cured resins usually require baking at temperatures above 200°F, which affects physical properties of the metal; cold-curing resins simply won't do the job. One of the more successful approaches has been chemical conversion treatments such as Dow 7, Dow 17 and others.

Adds Resin Coating—Hughes Aircraft reports still another solution in coupling the Dow treatment with PT 401, a new coating developed by Product Techniques, Inc., Los Angeles. The system is being used on the firm's Falcon air-to-air guided missile. The Falcon, because it's carried by aircraft, is made almost entirely of magnesium. Until recently, it was protected by a combination of zinc chromate and lacquer.

The new material is an air-drying, thermosetting copolymer resin to which a catalyst is added just prior to use. It adapts to a variety of drying times, from four hours at room temperature to a half-hour at 140°F. Higher temperatures can be used in special cases, with proportionate reductions in curing time.

Hughes laboratories tested PT 401 on samples of magnesium sheet, magnesium extrusion, and magnesium die casting; 2024 T3 aluminum sheet (non-clad); and 4130 steel sheet. Galvanic corrosion samples were riveted with 5056 rivets.

Stands Thermal Shock—In temperature cycle tests, coated panels were heated to 500°F and then cooled by being placed directly on dry ice. There was no measurable effect on the samples.

A coating of MIL-L-7178 lacquer was worn through in 300 cycles of the Taber Abraser, using CS-17 wheels and 1000 g load. Wear resistance of PT 401 was 3½ times that of the lacquer.

Various tests were run to determine resistance to salt spray. Magnesium test panels were treated with Dow 7 and coated as follows: panel A, one coat PT 401; panel B, two coats PT 401; and panel C, two coats zinc chromate primer and two coats lacquer. An aluminum cross part anodized with chromic acid was riveted to each panel.

Subjected to salt spray, panel C started to corrode in 20 hours; in 85 hours it failed completely, as shown in Fig. 1. No corrosion was evident on panels A and B. At the end of 861 hours panels A and B,

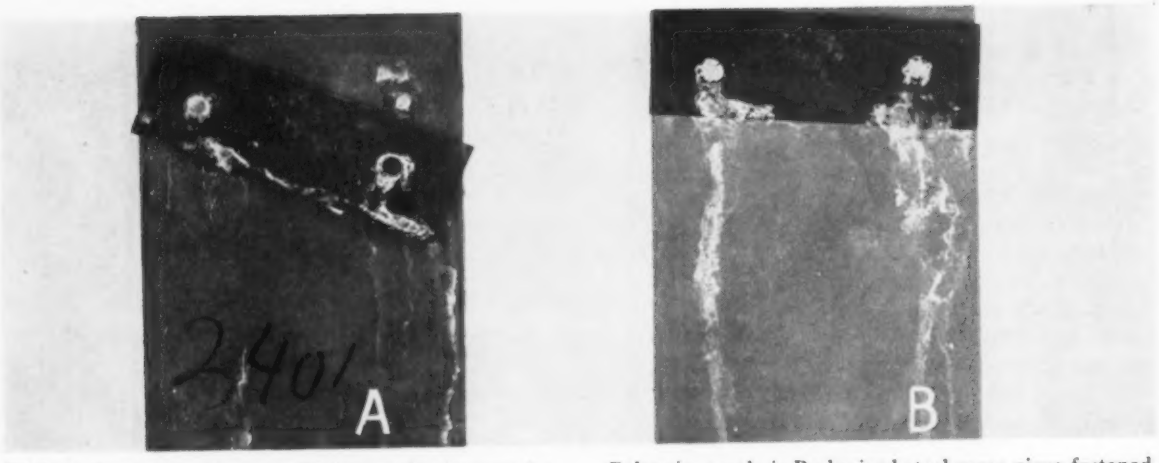


FIG. 2: Protection given in 189 hours of salt spray by two coats of PT 401 (panel A), and two coats of zinc chromate primer with two coats of lacquer (panel B). Galvanic couple is Parkerized steel cross piece fastened with aluminum rivets to magnesium panels. Most corrosion takes place between steel and rivet.

Extra Protection

coated with PT 401, were taken from the salt spray booth. Only slight corrosion was evident.

Not Compatible—Cross strips of 4130 Parkerized steel and 2024 chromic acid anodized aluminum were given one coat of PT 401, then riveted to magnesium panels coated as follows: panel A, two coats zinc chromate primer and two coats lacquer; panel B, two coats zinc chromate primer alone. Corrosion was rapid on panel B, developing all along the galvanic couple in 60 hours, while panel A remained unaffected. This shows PT 401 is not at all compatible with zinc chromate for protection in galvanic couples, and contact between them should be avoided.

Fig. 2 compares the protection given by two coats of PT 401 (panel A), and two coats zinc chromate primer with two coats lacquer (panel B), against the galvanic couple between magnesium and steel. Corrosion progressed slowly in both cases, with most of it taking place between the Parkerized steel and the bare aluminum rivet. The rivet on panel A is completely eaten through. Re-

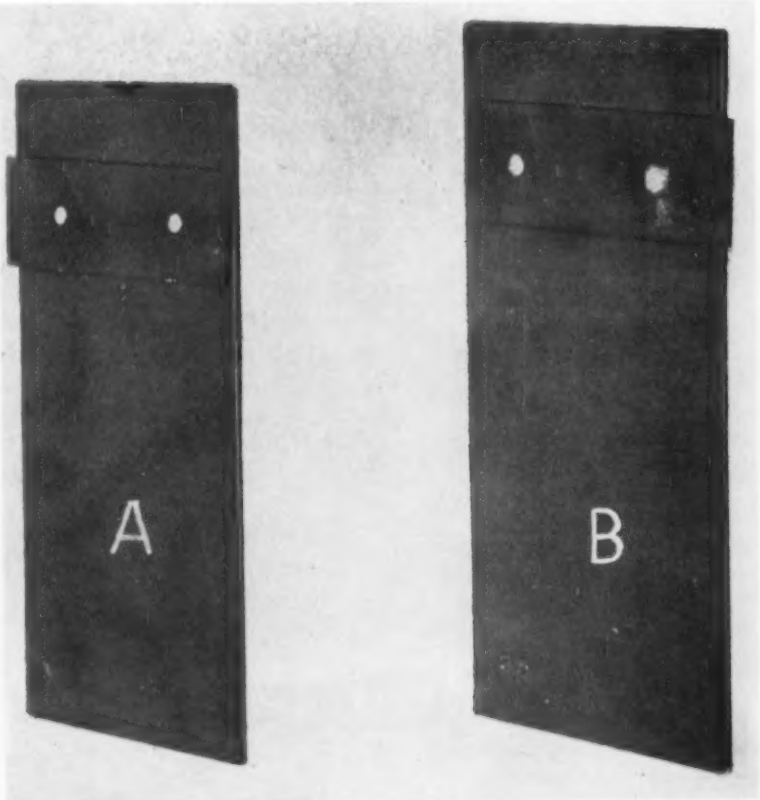


Fig. 3: Steel-magnesium couples after 860 hours in salt spray. Both were pretreated with Dow 7; panel A has one coat of PT 401 and panel B has two coats.

sults of this test indicate that two coats PT 401 give the same protection as the four-coat system of zinc chromate and lacquer.

In the next series a combination of Dow 7 and PT 401 was tested with three different treatments of the aluminum cross strip: a room-temperature chemical conversion coating; sulphuric acid anodizing; and chromic acid anodizing. Corrosion progressed very slowly in all cases, with the chemical conversion coating giving slightly less protection than the other two.

Protects Steel-Mg Couple—Fig. 3 shows the corrosion protection between Parkerized steel and magnesium when both plates and cross strip are coated with Dow 7 and PT 401. Slight corrosion occurred on the rivets, but none was visible on the plates after 860 hours of salt spray.

The next series tested the following coats on magnesium after a preliminary Dow treatment; panel A, one coat PT 401; panel B, two coats PT 401; panel C, two coats zinc chromate primer; and panel D, two coats zinc chromate and two coats lacquer.

Each panel was scratched to the bare metal with a steel scribe to let corrosion start. The amount of spreading, as shown in Fig. 4, indicates deterrent effects of the coatings. Zinc chromate gave the least protection, and PT 401 the most. Two coats of PT 401 gave as much protection as two coats of zinc chromate primer and two coats lacquer.

Now in Service—For several months Hughes Aircraft has been using PT 401 on the Falcon and on the launcher. Some of these applications involve storage for as long as five years near the ocean.

The resin has other uses as well. It has been applied to chemical tanks, ventilating stacks subject to acid fumes, and the interior of pipes carrying salt and acid solutions. Its adherence to steel, aluminum alloys and plastics is good if they are properly pretreated.

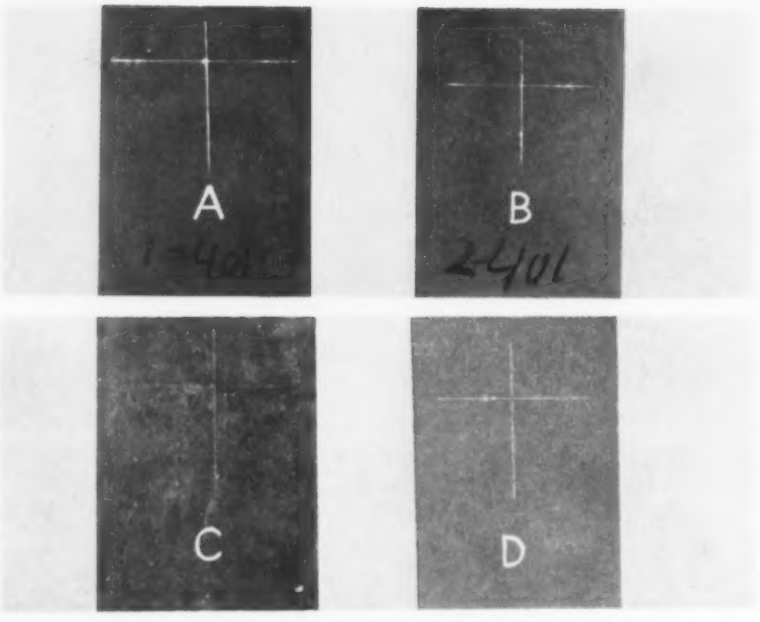


FIG. 4: After pretreating all four with Dow 7, panel A was given one coat of PT 401 and panel B received two coats; panel C has two coats of zinc chromate primer and panel D has two coats of lacquer over two of zinc chromate. All were scratched to bare metal and exposed for 189 hours in salt spray.

Properties of PT 401 Coating

Pencil hardness	6 H
Taber abrasion resistance	3200 cycles/mil with CS-17 wheel
Weathering (accelerated)	Unaffected in 1000 hours
Exterior durability	Unaffected in 3 months
Saturated salt spray resistance	Unaffected in 1000 hours
Cold check resistance (−40° to 200° F cycle)	Unaffected after 25 cycles
Flexibility	Unaffected by bend over 3/8 in. mandrel
Impact resistance	Greater than 12 inch-pounds
Temperature range	−65 to 500° F

No apparent deterioration on steel and aluminum samples coated with PT 401 and immersed for one month in:

ethyl alcohol	mineral spirits	sodium methoxide (40%)
secondary butyl alcohol	carbon tetrachloride	detergent solution
methyl isobutyl carbinol	allyl chloride	citric acid (10%)
toluene	linseed fatty acid	sodium hydroxide (20%)
xylene	acetic acid (50%)	ammonia vapor
hydrochloric acid (36%)	hydrochloric acid vapor	sulfuric acid (70%)
nitric acid (20%)	sodium chloride (25%)	sodium hydrochloride (5%)

Magnesium Makes Drilling Job Easier

Some factors limit choice of materials, especially with lightweight parts.

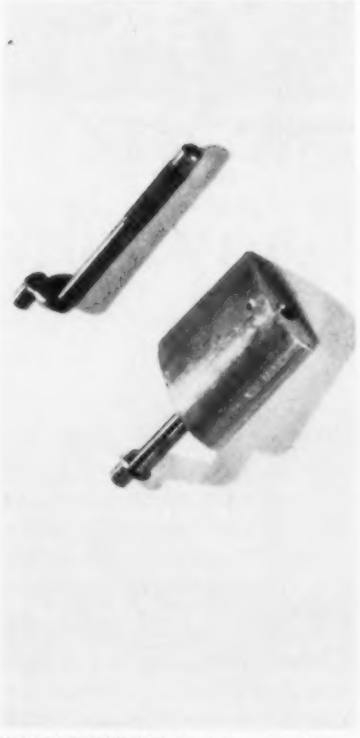
Here's a case where good choice of material clears up a machining bottleneck with added benefit of actually lightening the part.

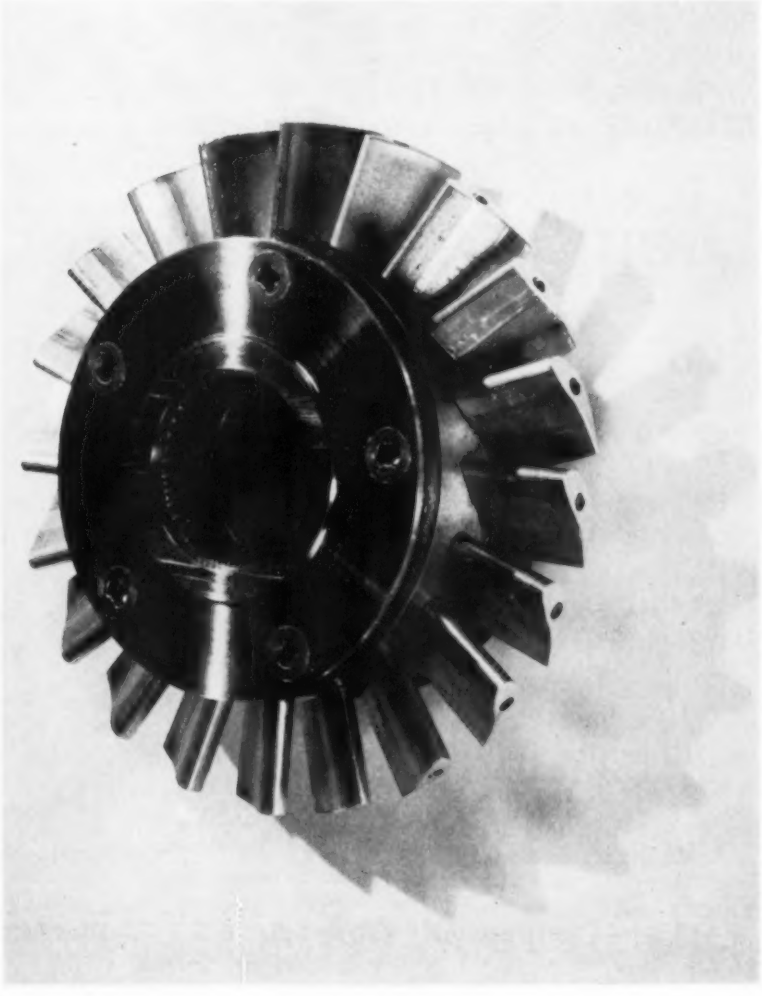
▪ Magnesium's high-speed machinability boosts output of stator blades for the torque-convertor portion of Chevrolet's Turboglide transmission. Magnesium extrusions replaced aluminum for the blades because machinists at Chevrolet's Toledo Div. found they could drill straight through at 24 ipm with 10,000 rpm drill speed.

Each blade has a longitudinal 5/32-in. hole to receive a tubular crank-arm. The crank-arm engages a variable-pitch control system.

Extend Tool Life—Aluminum drilling speed was only 8 ipm. It took considerable lubrication and backing off of the drill to remove chips. The holes had to be reamed. Even though magnesium requires less lubrication and no drill removal, tool cutting edges last longer.

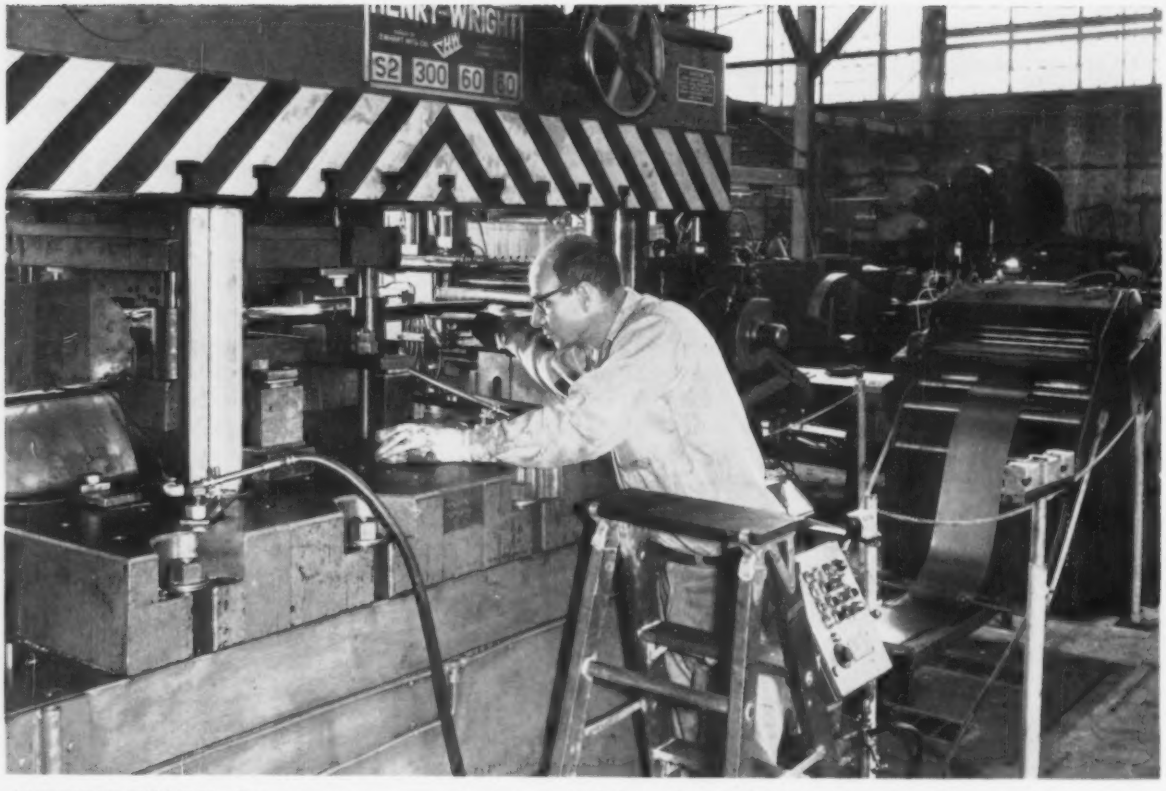
Magnesium's one-third weight saving over aluminum is an added factor in getting 115-lb weight advantage over the company's Powerglide transmission.





FAST DRILLING (above): Chevrolet drills hole in air-foil section of shaved magnesium extrusion at 24 ipm.

DUAL PURPOSE (right): Crank-arms hold blades on stator hub and engage pitch control system to position blades.



GETTING READY: Operator starts new coil of strip steel through the 300-ton automatic dieing machine.

Dieing Machine Does Many Jobs for Contract Stamper

By **W. H. Dutcher, Jr.,** Superintendent, Specialty Dept., The Budd Co., Philadelphia

Flexibility is the key factor in the contract stamping shop.

Presses must work fast and accurately; die setups must be changed in a hurry.

To get more speed, plus stamping economy, The Budd Co. recently installed a new dieing machine.

▪ Regardless of the size of a contract stamping shop, whether it makes a profit depends largely on its readiness to accept a wide variety of work.

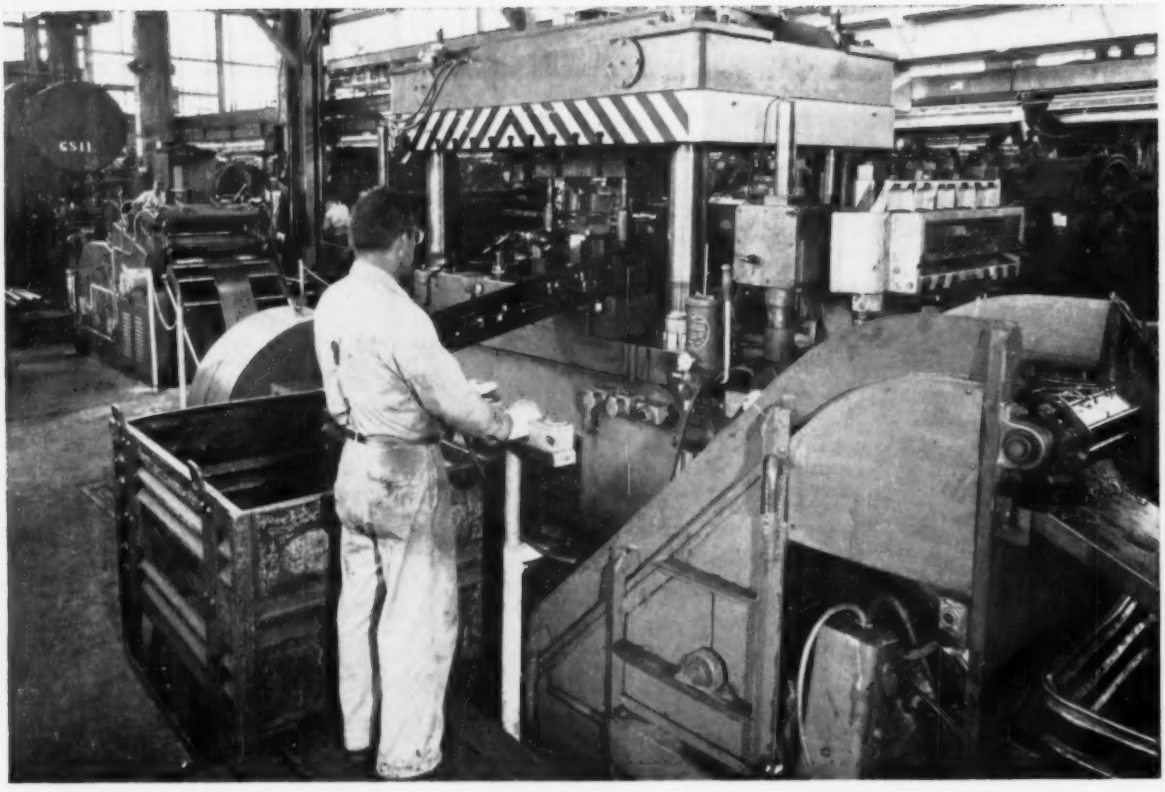
But "readiness" means more than the will to take on business; it also means that the shop has the right machines to do each job most efficiently. Only in this way can work be competitively priced and profitably run.

This is the philosophy of The Budd Co.'s Specialty Dept. in Philadelphia. With about 90 pct of its business in the highly competitive automotive stamping field, it bases its operations on machine flexibility and automatic production methods.

To improve its flexibility and gain added economies as well, the firm recently installed a Henry & Wright 300-ton, double crank, automatic dieing machine. The unit was made by The Hydraulic Press Mfg. Co., a division of Koehring Co., Mt. Gilead, O.

Meets All Demands—Budd officials decided to buy the machine only after they were satisfied that it would (1) do progressive stamping, (2) use coil stock, (3) be highly accurate, (4) not reduce the life of costly tooling, (5) provide for quick, easy die changing.

The press was delivered and put to work as a standard production unit even before any of its special,



REAR VIEW: Stampings drop from chute into tote box. Press has duplicate controls front and back.

high speed dies were received. This orientation period gave the company some extra production while the dieing machine's operators became acquainted with its functions.

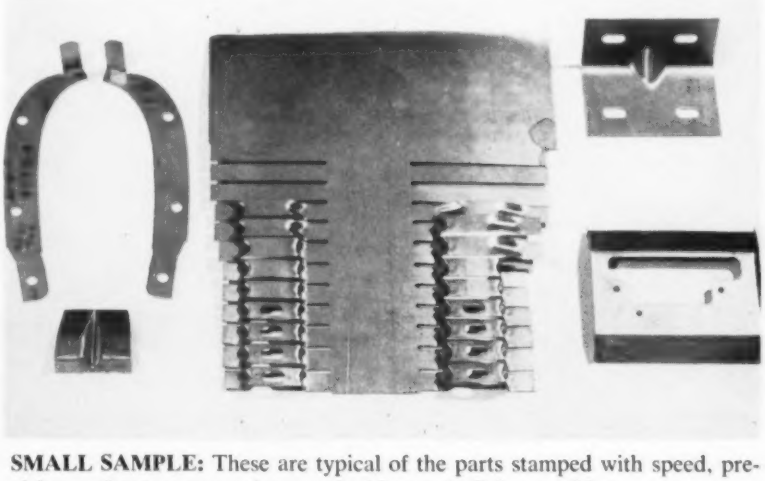
Because the press makes up to 120 strokes per minute, its tooling must take the strains caused by the speed and heat of rapid stamping. Dies are made of high-carbon, high-chrome steel with added vanadium. There are about eight stations in the average die.

Easy On Wear—The company finds that the accurate vertical travel of the dieing machine's crosshead saves wear and reduces maintenance costs, particularly on the cutting steels of the dies.

Instead of using spring strippers, dies for the new machine take advantage of the crosshead-mounted air cylinders which were furnished with it. Budd's basic coiled stock is hot rolled SAE 1010 steel, about 20 in. wide. However, the press can handle material up to 24 in. wide.

Experience shows that on the firm's stamping runs, which range from 4000 to 100,000 pieces, dies must be changed at least once a day. The new press permits making these changes with the same speed as on conventional presses, and the company hopes that, with added experience, it can cut this time still more.

Although the new machine is only a few months old, Budd is sure that it will pay for itself in less time than was anticipated. To date, it has shown that it works economically with any die.



SMALL SAMPLE: These are typical of the parts stamped with speed, precision and economy on the new double-crank dieing machine.

Vacuum-Lift Transfer Unit Positions Heavy Plate

Usually, transfer systems just bring heavy work to the loading station. Then comes the tedious job of manual positioning.

Yet, most operations don't warrant a separate positioning unit.

Here's a combined vacuum lift and gantry crane unit that does both, without manual handling.

▪ Manual positioning of heavy plate stock for rough shearing caused something of a bottleneck at General Motors' Electro-Motive Div., Chicago. Finally, GM's process engineers decided to do something about it. Together with the Noble Co., Oakland, Calif., they developed an automatic plate-handling setup, designed around a traveling gantry crane with vacuum lift.

It worked so well that the same idea has now been extended to an automatic blast-cleaning operation.

Two cranes are used here. One brings stock to the Wheelabrator machine loader. At the same time the second crane removes cleaned plate from the unloading end.

How It Works — The gantry crane, depending on vacuum for its holding action, has four adjustable rubber suction cups. These cups, mounted in pairs on a lift boom, swivel horizontally for greater flexibility in size of plate that can be handled.

A 3-hp vacuum pump mounted on top of the crane develops vacuum in the cups of about 29 in. of mercury. Lifting capacity of the crane is 3000 lb, the weight of a 1-in. steel plate measuring 5 by 15 ft. New cups can support this maximum load for 3 to 5 minutes after the vacuum pump is turned off.

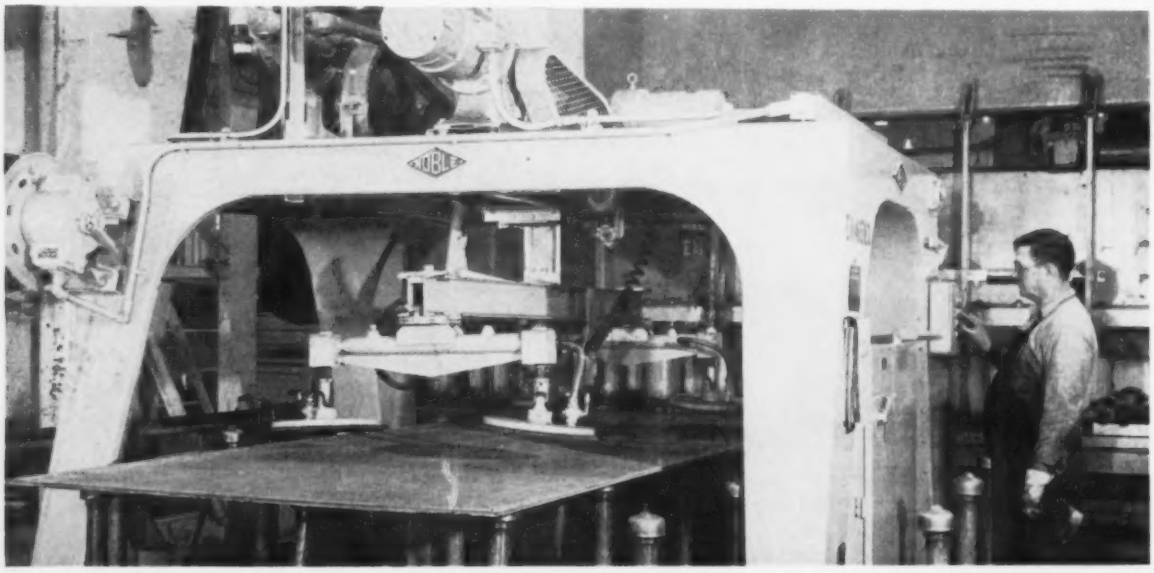
Width of plate handled ranges from 1½ to 6 ft. Maximum length is 16 ft for 3/16-in. plate; greater lengths sag where they extend beyond the suction cups, interfering with feeding tables. Minimum plate length is 3½ ft.

Cycles Automatically—On automatic cycle, the gantry crane picks up a single sheet of stock, carries it to the shear, deposits the sheet on the feed table and returns to the stack for another sheet. Limit switches control the cycle. They permit selection of sheet from one of two stock racks. The operator selects by switching to the proper circuit on the gantry's control panel.

As the gantry moves over the desired stock rack, it actuates a limit switch. The gantry stops and the boom lowers until the vacuum cups contact the top sheet.

At this point the vacuum pump builds up vacuum between the cups and the sheet. When the vacuum reaches maximum, the boom rises until it trips another limit switch.

On moving forward to the shear,



POSITIONING STOCK: Gantry crane equipped with vacuum lift brings flat plate to power shear. Switching to hand controls, operator accurately positions heavy plate for feeding without manual handling.

the gantry's forward progress trips a dog on the track. This stops the gantry behind the ball-type feed table.

Mechanical Positioning — The operator uses hand control to position plate in the shears. First he releases a mechanical safety device. Then he depresses the "forward" button until the gantry wheel clears the trip dog.

The gantry continues until stopped over the ball table by another limit switch. The operator now positions the plate for feeding into shears.

If desired, gas cocks mounted on each cup can be used to shut off any one or all four. With three closed the crane can be used as a transfer device, even in automatic cycle.

The cups can be moved into any position to pick up plate within their range. With the four cups in a straight line, the load must be centered. Otherwise, because of universal joint connection between cups and their racks, the plate won't hang evenly.

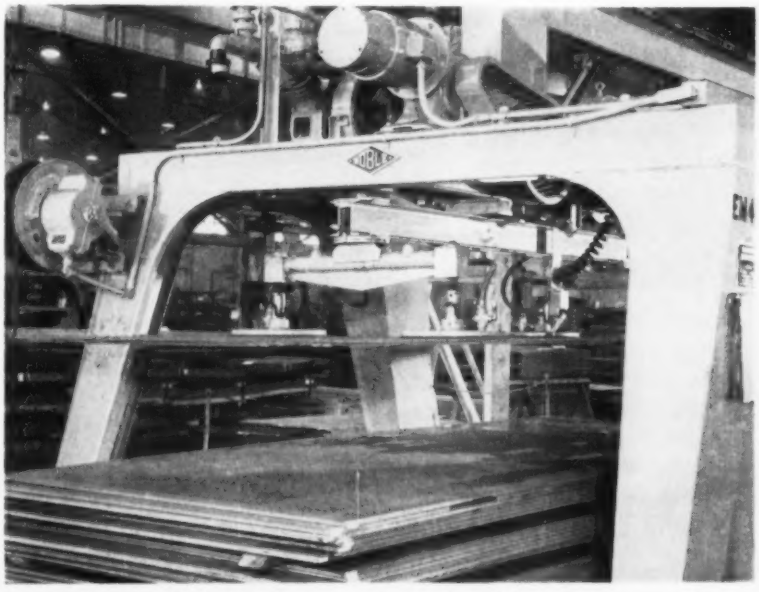
More Advantages—In addition to reducing handling costs in both applications, the system cuts process time on the shears as much as a half. Output is evener because operator fatigue is virtually eliminated.

With the auto cycle in effect the gantry cuts lead time by bringing a sheet forward while the operator is still trimming the piece on the table.

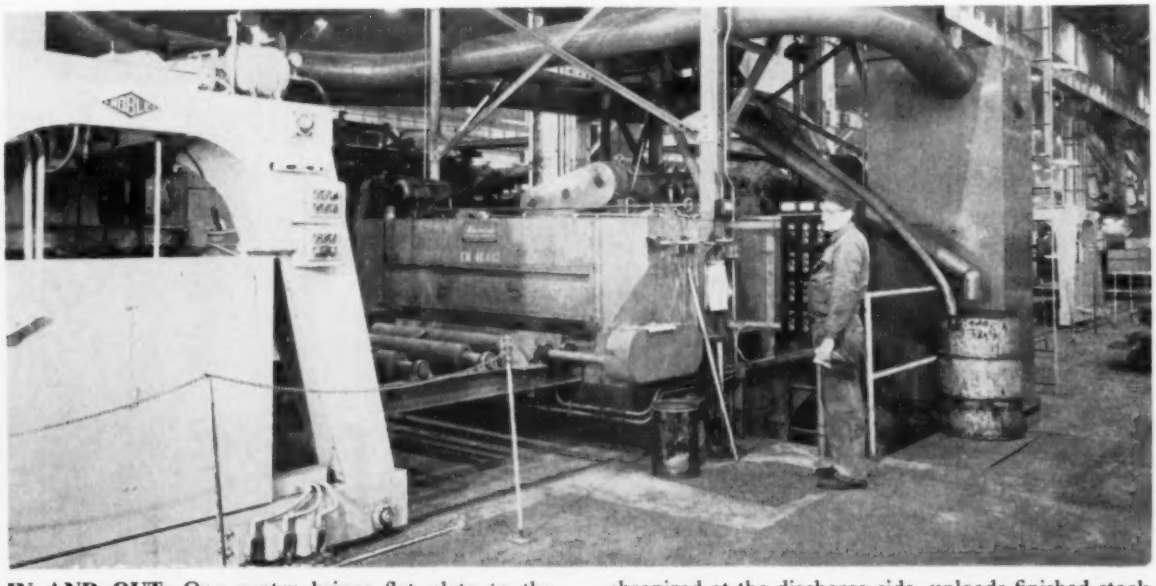
In the shot-blast operation the auto cycle loads a sheet on the machine feed table while the previous sheet is still feeding through. At the discharge side the unloading crane is synchronized to take sheets away at the same speed.

On this operation the gantry cranes travel at 180 fpm. Travel speed is 120 fpm at the shears.

The gantry system is far safer than manual handling. With trained operators, the track dogs and limit switches insure safe operation.



AUTOMATIC PICKUP: On automatic control the gantry crane picks up large sheets from a stock rack located at the end of the track.



IN AND OUT: One gantry brings flat plate to the Wheelabrator for blast cleaning while another, synchronized at the discharge side, unloads finished stock. At the same time, a third plate is being cleaned.

Lubricate Close Fits by Salt Bath

By G. B. Troup—Vice President and General Manager, Lubri-Case, Inc., New York

Modern high speed machines require close tolerances and tighter clearances than ever before.

The result is a growing problem in lubrication—finding ways to keep sliding, rotating and reciprocating ferrous-metal parts from scoring and seizing.

A lot of it is being overcome by this salt bath treatment.

▪ High speed machinery, jet engines and missiles, together with their instruments and accessory drives, present some real problems in lubrication. For adequate strength and precision at higher loads, speeds and temperatures, it's been necessary in many cases to make ferrous metals act as bearings. Couple the poor compatibility of mated ferrous metals with increasing use of low-lubricity lubricants and the result is likely to be excessive wear, scoring and seizing.

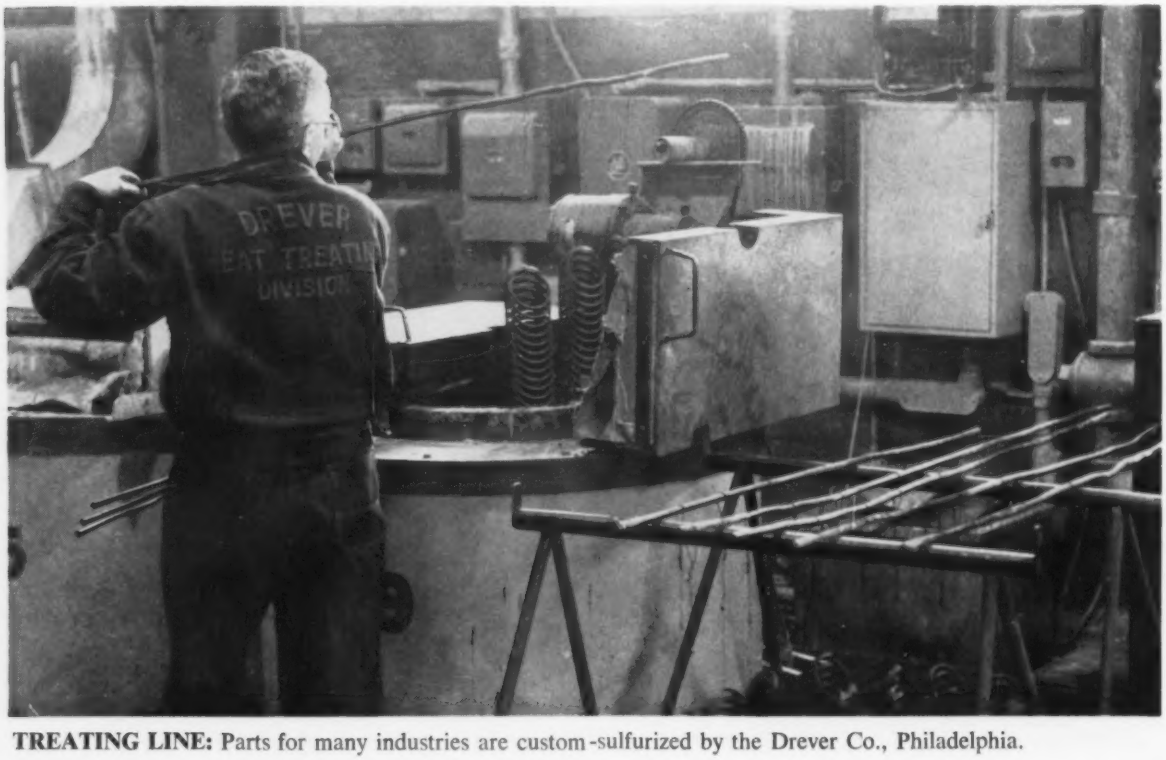
Many of these problems are being overcome by the Lubri-Case method —basically, a salt bath treatment which produces a case high in iron sulfide on any ferrous metal. The molten salt bath contains sulfur in an incompletely oxidized form. With the bath at about 1050°F, parts are immersed anywhere from a few minutes to several hours, depending on the material and depth of case desired.

Sulfide films formed by the reaction of extreme-pressure additives to lubricating oils may be on the order of 10^{-6} in. in depth; the case produced by the salt bath method is more than 1000 times thicker.

The sulfurizing salt bath also contains a specified minimum of cyanide, but the Amsler wear test results in Fig. 1 show that any nitriding that may result is merely incidental; sulfurizing is the really effective mechanism of the process.

What it Does—The potential of a bearing material to operate with scant lubrication is expressed in terms of dwell time—that is, time until measurable wear begins, after first applying one drop of mineral oil.

Dwell times for untreated and sulfurized cast iron journals are compared with that of a bearing-bronze journal in Fig. 2. All three were operated with an AISI 4142 steel shaft. Changes in chemical, metal-



TREATING LINE: Parts for many industries are custom-sulfurized by the Drever Co., Philadelphia.

Sulfurizing

lurgical and mechanical properties resulting from sulfurizing apparently raised the compatibility of cast iron with steel to that of a bronze bearing alloy.

High speed mechanisms usually require the ultimate in fit and balance. Small clearances prevent hydrodynamic lubrication so that boundary lubrication conditions always exist when the parts are first assembled. In addition, low viscosity and low lubricity lubricants are being used in more and more applications.

Sulfurizing permits economical run-in of such assemblies until hydrodynamic lubrication takes over. Finishing costs can be reduced and lower-cost ferrous metals employed, as the net lubrication effect has now become a function of the sulfide case properties. Base materials need only be selected on the basis of mechanical strength.

Prevents Breaking Film — When dissimilar metals are used in precision assemblies, differences in their coefficients of expansion can cause the oil film to be punctured when parts squeeze against each other. Sulfurizing not only produces self-lubricating protection against seizure; it also reduces the likelihood of oil film penetration, as it permits all ferrous assemblies to be made with fairly uniform coefficient of expansion.

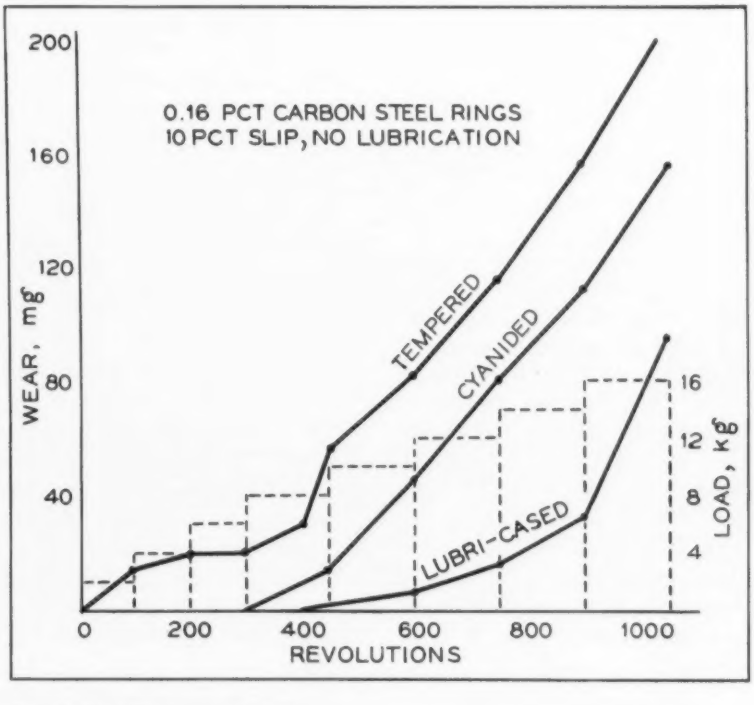
In high speed ball bearings using ball riding pressed-steel cages, a large ball-pocket contact area must be used to minimize eccentric cage operation or wobble. Scuffing occurs between the rolling elements and their cages where the sliding velocity is highest. Under dry conditions and in the presence of oxygen, frictional heat causes bearing failure by formation of oxides which flake off and abrade the bearing.

However, in the presence of a fluid which restricts oxidation or cools the bearing, the oxidation-abrasion mechanism is suppressed and scuffing becomes the major problem. Lubri-Case treatment has resisted scuffing at temperatures as high as 900°F, and has been particularly useful during the running-in period where low lubricity lubricants have had to be used.

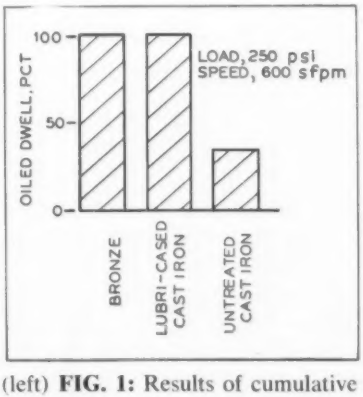
For Hydraulic Pumps—In order to raise output pressures at high efficiency, manufacturers of hydraulic equipment have increased speeds and reduced clearances. In aircraft, missiles and even machine tools, pumps must often operate at temperatures as high as 600°F, surface speeds of 30,000 fpm and hydraulic pressures of 3000 psi.

Such operating conditions have made use of petroleum-base hydraulic oils impossible; lower-lubricity fluids such as the diesters, silicates and silicones have had to be used. Furthermore, these synthetic lubricants are often corrosive to non-ferrous alloys. All-ferrous construction is necessary for strength and precision.

Producers of radial-type rotary piston pumps have found Lubri-Case sulfurizing to be an effective means of maintaining size and reducing wear on pistons and track rings. Evaluation tests are also under way on cylinder blocks and valve



(left) **FIG. 1:** Results of cumulative wear tests on Amsler machine compare wear resistance of rings after treatments at 1050°F.



(above) **FIG. 2:** Comparison of dwell times of different journal bearing materials against an AISI 4142 steel shaft. Sufurized cast iron proved equal to bronze.

TABLE I | **Comparison of Wear**

	Liquid Carburized Pin	Lubri-Case Sulfurized Pin
Case hardness	90 R 15 N	88 R 15 T
Frictional torque, lb-in.	28	21
Scar width, in.	0.065	0.0375
Final psi	15,400	26,700
Pin weight loss, gr	0.0163	0.0003
Pin condition	scored	smooth

Results are for a one-hour wear test on a Falex machine, using SAE 30 minera oil and 1000-lb loading.

plates of axial-type rotary piston pumps.

Solid Boundary Films—When a boundary film is solid, the amount of metallic interaction may be a thousand-fold less than when the film is molten. This explains the marked superiority of sulfide layers over phosphides.

Sulfides, because of their high melting point, are effective in the absence of oxidizing conditions to 1500°F; low-melting phosphide eutectics are basically inactive and provide lubrication only when they are themselves lubricated with a conventional lubricant. The adoption of sulfurizing for improving life of journal bearings handling molten lead is a natural result.

Numerous cutting tools, particularly those with large rubbing surfaces such as broaches, threading and engraving tools, reamers and milling cutters, have shown increased life ranging from 300 to 1000 pct. It has been stated that at temperatures above 900°F tool wear is less with mineral oil than with compounded cutting oils, and above 1050°F tool wear becomes a function of temperature alone. As oil additives lose their value so markedly, it's easy to see why Lubri-Case built-in lubrication is so effective in heavy duty applications.

High Load Uses—Compared to most synthetic high temperature lubricants, "Type A" transmission fluid possesses good lubricity. In several instances, however, increasing the output of equipment handling this fluid resulted in wear of the ferrous metal bearings.

One manufacturer of rotary pumps for refrigeration units encountered seizure in the bores of ductile iron cylinders when output was raised above 3 hp. After the salt bath sulfurizing treatment, this same rotor was able to operate satisfactorily under overload conditions producing 15 hp.

In another instance, an automotive equipment manufacturer had increased the speed of sliding-vane type rotary pumps for power steering to over 12,000 rpm. The centrifugal force of the high speed steel vanes caused excessive wear on the cam ring. Lubri-Case treatment of the vanes extended pump life from an average of 20 to the required 100 hours under test conditions.

Material Substitution—To obtain good electrical properties, an electronic manufacturer made a small precision high-speed rotor from Armco iron. With this rotor acting as its own bearing, salt bath sulfurizing was found to be the only means of raising compatibility of the metal to a satisfactory level.

In another case, a spur gear pump producer replaced the bronze wear plates and bearings of his gear pump with sulfurized cast iron. This reduced costs, and also eliminated the problems associated with different coefficients of expansion that had previously caused trouble when the pumps heated up. Increased volumetric efficiency resulted.

Under conditions of light loading, salt bath sulfurizing has replaced carburizing with both a cost saving and improvement in performance. Table I compares friction and wear properties of the two.

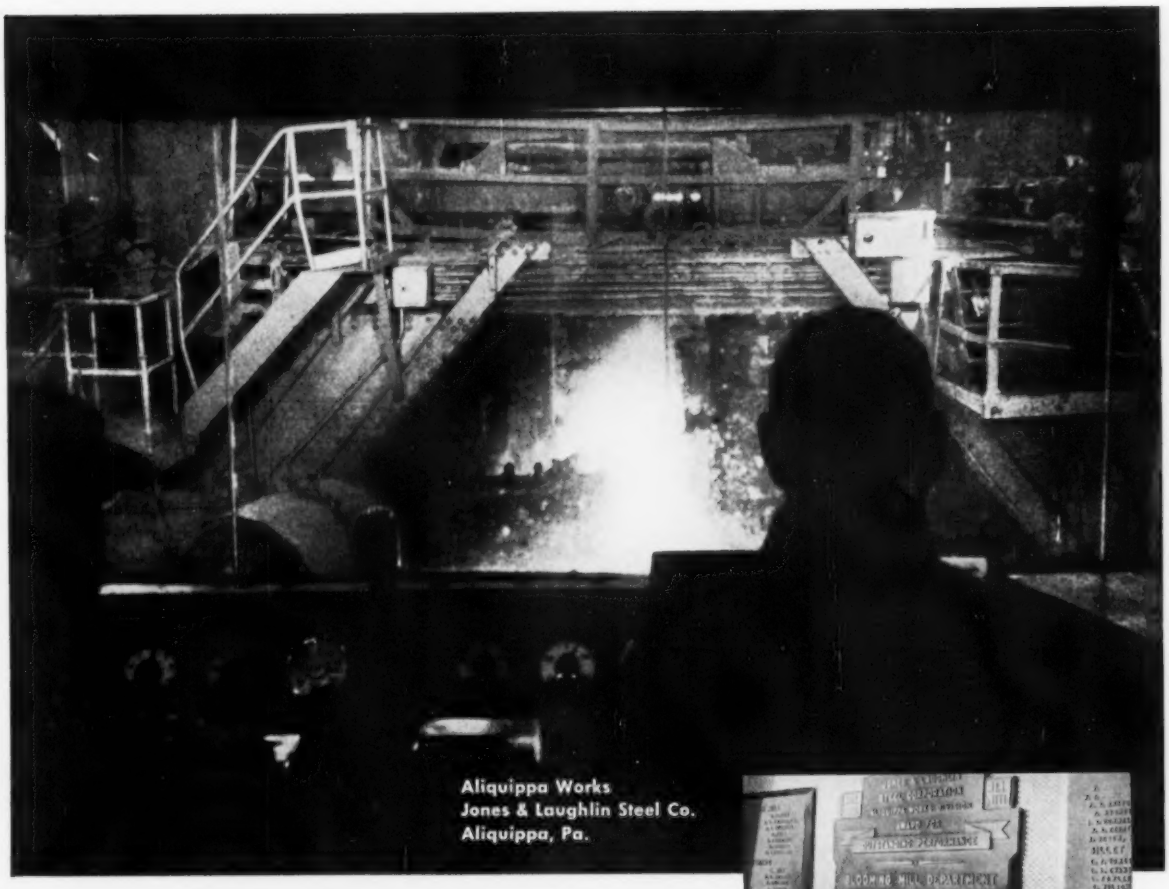
Speeds Production—A manufacturer of spinning and twisting rings for the textile industry increased traveler life nearly 20 times by sulfurizing the ring. Furthermore, frame speeds were increased and run-in ceased to be a problem, even though finishing costs on rings were reduced. The net result was a maintenance labor saving of 14 pct and an increase of more than 16 pct in yarn production.

A leader in the aircraft engine field regularly encountered scoring of chromium plated cylinder bores during the wearing-in period. High output engines require high-strength iron piston rings which are difficult to seat. Salt bath sulfurizing solved this difficult problem.

In a bench test, sulfurizing raised the scuff load of an SAE 52100 piston ring from an average of 3820 to 6352 psi and the minimum value from 1570 to 6100 psi.

The salt bath sulfurizing process provides an effective, built-in, extreme pressure additive. As a result, lubricants of lower lubricity can be tolerated.

Because of its low process cost and the broad adaptability of base materials, sulfurizing is ideally suited for mass production of low cost items which require exceptional wear resistance.



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An ingot a minute!

and never a lubrication failure with Cities Service EP-21 Lubricant!

At Jones & Laughlin's Aliquippa Blooming Mill, they believe in production with a capital "P"!

Not only does J&L's Aliquippa Mill hold the world's record for ingots rolled in an eight hour turn (576), but they've set a year-in, year-out average of an ingot per minute!

How do they sustain this production for such long periods?

One answer lies in their modern, 44-inch, two-high reversing unit, powered by four 3000 h. p. motors arranged in tandem twin drive.

Another can be found in their lubricant . . . Cities Service EP-21.

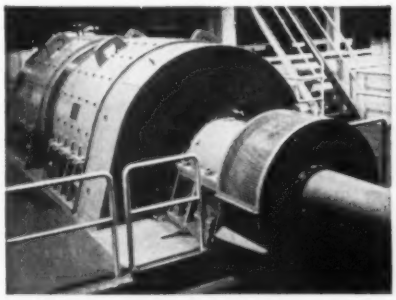
Used on main bearings, manipulator slides and window liners, Cities Service EP-21 and its superior additives provide an unusually tough film . . . tough enough to stand the highest pressures, the greatest shock loads with no loss of lubrication, no danger of rust or corrosion.

Yes, Jones & Laughlin is pleased with Cities Service lubricants! You'll feel the same when Cities Service goes to work in your operation. Talk with your Cities Service Lubrication Engineer. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

Award for 8-Hour Turn Record is displayed proudly outside mill. J&L smashed previous record by 38 ingots—rolled up new total of 576! Year-in and year-out, the plant averages an ingot a minute, with flawless lubrication provided by Cities Service.



Four 3000 h.p. Motors power the blooming mill at J&L's Aliquippa Works. These are 70 to 140 rpm, double-armature units arranged in tandem twin drive. At 70 rpm, they can reverse in under a second. Equally flexible is the mill's lubricant—Cities Service EP-21.

Mr. John S. Lea, Vice President, Kelley Manufacturing Company, Houston, Texas, reports:

"Republic Electro Paintlok® forming and application

"Republic Electro Paintlok is the ideal material for one of our major product lines, acoustical fastening members," continues Mr. Lea. "Fabricating the sheet into H and Z members, splines, angles and couplers requires extreme forming and bending. We know from past experience that the special coating on Republic Electro Paintlok won't crack, flake or peel off no matter what we do. This means that after painting and installation, Kelley Acoustical Fastening Members provide our customers maximum satisfaction almost indefinitely, with little or no maintenance at all."

This example is typical of the improvement made possible in an endless variety of products through the use of Republic Electro Paintlok. In addition, this versatile sheet often allows substantial savings in production time and money because it is shipped from the mill in prime condition for painting. In many cases only the final finish need be applied to provide full protection and attractive appearance. Cleaning and priming may be eliminated.

Finally, the chemically treated zinc surface of Electro Paintlok retards corrosion even when scratched through, and effectively limits it to the point of damage.

Get all the facts on this versatile sheet steel product and how it can help solve your forming and application problems. Simply contact your Republic representative or mail coupon.

STRUCTURAL APPLICATION PROBLEMS requiring low weight plus high strength are best solved using tubular construction. A good example is this rocket sled designed to withstand extreme forces of abrupt deceleration. Republic ELECTRUNITE® Steel Mechanical Tubing is ideal for such an application. Uniform in wall thickness, concentricity, strength and ductility, it permits reduction in bulk without sacrifice of safety. Send coupon for data.

CORROSIVE APPLICATION PROBLEMS, like this coal-cleaning plant disc-type filter unit, demand the strength and corrosion resistance of Republic ENDURO® Stainless Steel. Here the stainless steel cloth used to cover disc segments is not only much more durable, but more than twice as efficient in recovering coal "fines" as the cotton cloth formerly used. To be sure of the best, specify ENDURO.

REPUBLIC

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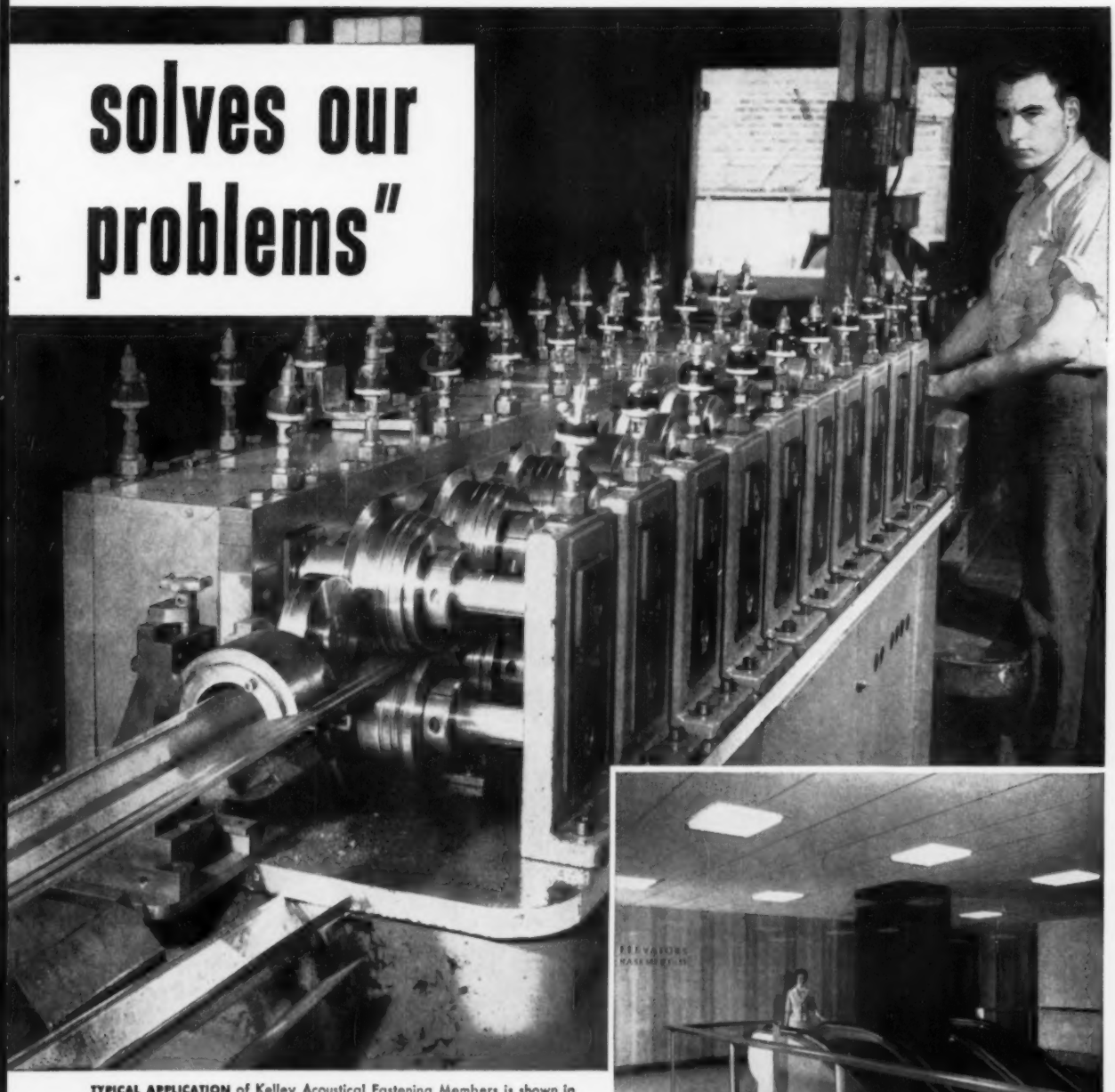
World's Widest Range of Standard Steels

solves our problems"



TYPICAL APPLICATION of Kelley Acoustical Fastening Members is shown in the ceiling at right. Base metal is Republic Electro Paintlok. Its special coated surface grips paint tightly, assuring years of maintenance-free good looks. Even severe forming, like the operation shown above, has no effect on its outstanding paint-holding characteristics. Coating will not crack, flake or peel off.

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New Catalogues And Bulletins

Shell Molding

In a new product bulletin there's data on a highly-refractory magnesium silicate for shell molding steel castings. It tells how the material's mineral composition, physical and thermal properties and grain sizing all contribute to its performance in resin-bonded shell molding. (Harbison-Walker Refractories Co.)

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Fork Truck Guide

Potential purchasers of electric fork trucks can impartially evaluate various types and models through a comparison chart now available. The chart enables users to survey simultaneously the operating, design and maintenance characteristics of three different trucks by filling in appropriate categories. (Lewis-Shepard Products, Inc.)

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Squarehead Cylinders

In 30 pages a bulletin gives information on recently-introduced square-head hydraulic cylinders. Of tie-rod construction, they are rated for 2000 psi working pressures, up to 3000 psi in nonshock service. (Wellman Engineering Co.)

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Masking Aids

Time-saving masking aids for better product finishing are described in a 4-page brochure. It includes data on overlapping masking discs in rolls, in stock sizes from ⅛ to 2 in. They come in increments of 1/16 in. and split-back discs from 2⅛ to 9 in. A complete line of useful masking plugs, caps, corks, etc., are featured. (By-Buk Co.)

For free copy circle No. 4 on postcard, p. 81

Thread Inserts

Self-tapping thread inserts, with Class 3B internal threads, are described in a folder. These inserts are especially designed for aircraft applications. (Groov-Pin Corp.)

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Pneumatic Tools

Pneumatic tools are subjects of a 4-page catalog. It covers a com-

pany's line of rotary vane type air-driven hand tools for contour finishing and grinding of dies, for finishing molds, patterns, forgings and castings and for deburring machined parts. (Doeden Tool Corp.)

For free copy circle No. 6 on postcard, p. 81

Flush Pin Gages

Flush pin gages and dial indicator gage units are subjects of a 16-page catalog and price list. A new system allows a choice of 650,000 standard bar and barrel type gage variations to be ordered by number alone. (Rite-O Tool & Gage Co.)

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Slotted Angle

A booklet discusses benefits of a high speed framing system for building repeating pattern structures with steel slotted angle material. The material works with practically any size job. But it's especially economical when building shelving, racks, tables, platforms or any structure that repeats a basic pattern. (Acme Steel Co.)

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Truck Drive

Torque converter drives for fork lift trucks are described in an 8-page booklet. Illustrations help show operating advantages of the drive. (Buda Div., Allis-Chalmers Mfg. Co.)

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Electric Substations

A unit substation "technical library" comprises seven individual publications. (General Electric Co.)

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Ore Milling

Milling at Cominco's H. B. Concentrator at Salmo, B. C., is described in the latest issue of a com-

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 81.

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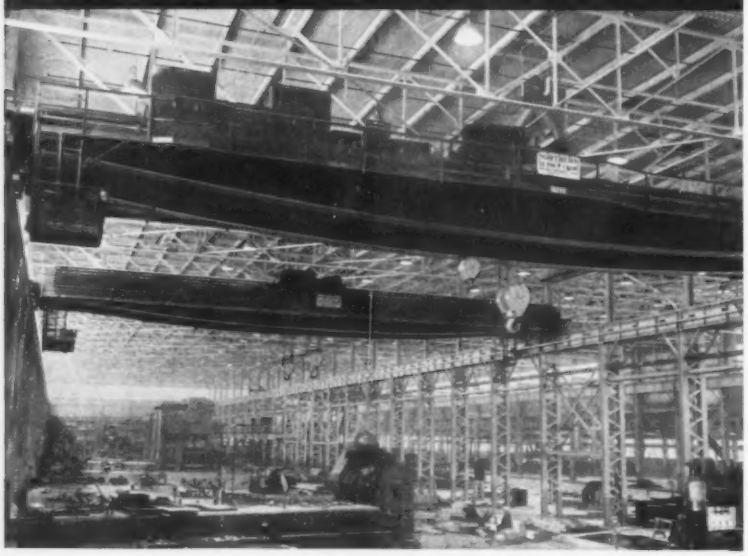
Manufacturers of Iridite Finishes for Corrosion Protection and Paint Systems on Non-Ferrous Metals; ARP Plating Chemicals

Look Overhead... see "NORTHERN"



these notable twins assure dependability

LOCATION Press bay of a large, new plant manufacturing rear axle parts and components for automobiles and trucks.

SPAN 96 feet 10 inches, centers of runways.

CAPACITY 30-tons on Main Hooks, 10-tons on auxiliary hooks.

ELECTRICAL EQUIPMENT 60-HP motors on Main Hoist, Auxiliary Hoist and Bridge Travel, and 15-HP motor on Trolley Travel, with full magnetic control and direct current on brakes.

ADVANTAGES These twin NORTHERN cranes serve twin heavy press lines located at each end of the press bay. Designed for heavy duty requirements with compensating type bridge end trucks, and equally suitable electrical equipment and controls, they dependably and safely speed machinery installation or relocation, and assure smooth, uninterrupted flow of work in today's and tomorrow's automated production.

Let us explore similar possibilities in your plant

NORTHERN MATERIAL HANDLING EQUIPMENT

NORTHERN ENGINEERING WORKS
210 CHENE ST., DETROIT 7, MICH.

FREE LITERATURE

pany publication. Crushing, grinding, screening and flotation of this 1000 ton per day lead-zinc operation is featured. (Denver Equipment Co.)
For free copy circle No. 11 on postcard, p. 81

Special Machines

A 16-page bulletin just released by a hydraulic press maker, details its facilities for making special industrial machinery. (Lake Erie Machinery Corp.)
For free copy circle No. 12 on postcard, p. 81

Die-handling Truck

Literature now available features an electrically powered walkie-type materials handling truck. This truck is especially designed to handle dies weighing up to 7500 lb. (Lewis-Shepard Products, Inc.)
For free copy circle No. 13 on postcard, p. 81

Metal-clad Plastics

A 6-page folder describes six widely used grades of metal-clad plastic laminates for printed circuitry use. (Synthane Corp.)
For free copy circle No. 14 on postcard, p. 81

Radial Drill

A new radial drill is described in a brochure. It contains complete specifications on the machine tool. (Veet Industries.)
For free copy circle No. 15 on postcard, p. 81

Twin Screw Pump

Twin screw pumps for handling non-corrosive liquids are featured in a bulletin. These pumps come in a wide viscosity range at pressures up to 350 psig, capacities to 550 gpm. (Warren Pumps, Inc.)
For free copy circle No. 16 on postcard, p. 81

Sponge Rubber

Properties of new silicone sponge rubber sheet for —100 to 480°F applications are detailed in a 2-page data sheet. (Connecticut Hard Rubber Co.)
For free copy circle No. 17 on postcard, p. 81

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Drilling Motor

Shunt wound well-drilling motors are illustrated in a 4-page bulletin. (General Electric Co.)

For free copy circle No. 18 on postcard

Air, Gas Dryers

Two bulletins just released describe one maker's air and gas dryers. Water is removed by these units through adsorption with a solid granular desiccant. Reactivation is accomplished with heat. (G. M. Kemp Mfg. Co.)

For free copy circle No. 19 on postcard

Power Generators

Medium capacity steam turbine-generator units are described in a bulletin. (General Electric Co.)

For free copy circle No. 20 on postcard

Dispersions

Listed in a 4-page bulletin are colloidal and semi-colloidal dispersions of graphite, molybdenum disulfide, mica, vermiculite, iron oxide, acetylene black, and copper. Carriers and diluents are given for each product, along with typical applications and important physical data. (Acheson Colloids Co.)

For free copy circle No. 21 on postcard

Structurals

An 8-page leaflet contains design information on lightweight structural sections. (Jones & Laughlin Steel Corp.)

For free copy circle No. 22 on postcard

Steel Strapping

Simplified, yet damage - proof methods of packaging and shipping items by freight car are described in a booklet. It tells how steel strapping aids shippers. (Acme Steel Co.)

For free copy circle No. 23 on postcard

Carbide

A carbide technical manual features the manufacture and physical properties of tungsten carbide. It also covers grade selection, applications, use of single point tools, recommended cutting speeds. (Firth-Sterling, Inc.)

For free copy circle No. 24 on postcard

Fork Truck

Of 2000-lb capacity, an electric powered fork truck is designed for quick handling and tiering of loads in confined areas. A brochure describes it. (Elwell-Parker Electric Co.)

For free copy circle No. 25 on postcard

Tantalum Capacitors

One maker of airborne "brains" uses tantalum capacitors exclusively. A 4-page publication tells why. (Fansteel Metallurgical Corp.)

For free copy circle No. 26 on postcard

Tool Steel Extrusion

Tool steels for hot extrusion processes are discussed in a comprehensive booklet. The 12-page publication contains several pertinent charts. (Crucible Steel Co. of America).

For free copy circle No. 27 on postcard

Handling Manual

Fundamentals of fork truck operation are presented in a 24-page manual. Literally full of illustrations, it's written so even beginners can easily absorb its information. However, it could also act as a handy reference guide for more experienced operators. (Hyster Co.)

For free copy circle No. 28 on postcard

Radial Drill

A 6-page folder covers a new radial drill. This turret type machine tool is a power indexing, automatic clamping unit. The folder

Postcard valid 8 weeks only. After that use own letterhead fully describing items wanted. 1/9/58

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FREE LITERATURE

reviews its many features. (Burg Tool Mfg. Co., Inc.)

For free copy circle No. 29 on postcard

Gages, Instruments

Products and services of a major gage maker are reviewed in a 20-page booklet. It covers a multitude of instruments, machines, meters, controls, etc. (The Sheffield Corp.)

For free copy circle No. 30 on postcard

Blower Cleaners

Blower-suction cleaning units are covered in a 4-page data folder. These cleaners can clean just about anything, anywhere. They're handy for getting into tight spots to clean motors, machinery, equipment, etc. (Clements Mfg. Co.)

For free copy circle No. 31 on postcard

Builders' Stainless

Products of stainless steel for architects and builders are dealt with in a 44-page reference manual. It describes a wide variety of factory-made stainless steel components, and lists their manufacturers. (Stainless Steel Producers Committee, American Iron and Steel Institute)

For free copy circle No. 32 on postcard

Stamping Firm

Entitled "Diversification," a 6-page folder illustrates the versatility of a company's stamping division. It tells how the firm produces deep drawn stampings for a variety of industries. (Transue & Williams)

For free copy circle No. 33 on postcard

Capacitors

Fixed pole-top capacitor electrical equipment is described in an eight page bulletin. (General Electric Co.)

For free copy circle No. 34 on postcard

Stainless Fasteners

An 8-page condensed guide identifies stainless steel fasteners normally carried in stock by one firm. (Allmetal Screw Products Co., Inc.)

For free copy circle No. 35 on postcard

Power Steering

Both operator morale and operating efficiency get a big boost from improved hydraulic power steering. So a major fork truck maker is featuring it on its large capacity models. The company's literature describes it. (Towmotor Corp.)

For free copy circle No. 36 on postcard

Speed Reducers

Worm gear speed reducers are covered in a 40-page booklet. It describes reducers with hp ranges from less than 0.1 to 121. (Jones Machinery Div., Hewitt-Robins, Inc.)

For free copy circle No. 37 on postcard

Refractories

Castable and plastic refractories are discussed in a bulletin. It describes plastic fire brick; refractory for pouring or molding; super-duty castable material; high temperature bonding mortar; acid-proof, ready-mixed cement; and fire brick and cupola block refractory products. (Robinson Clay Product Co.)

For free copy circle No. 38 on postcard

Fan Equipment

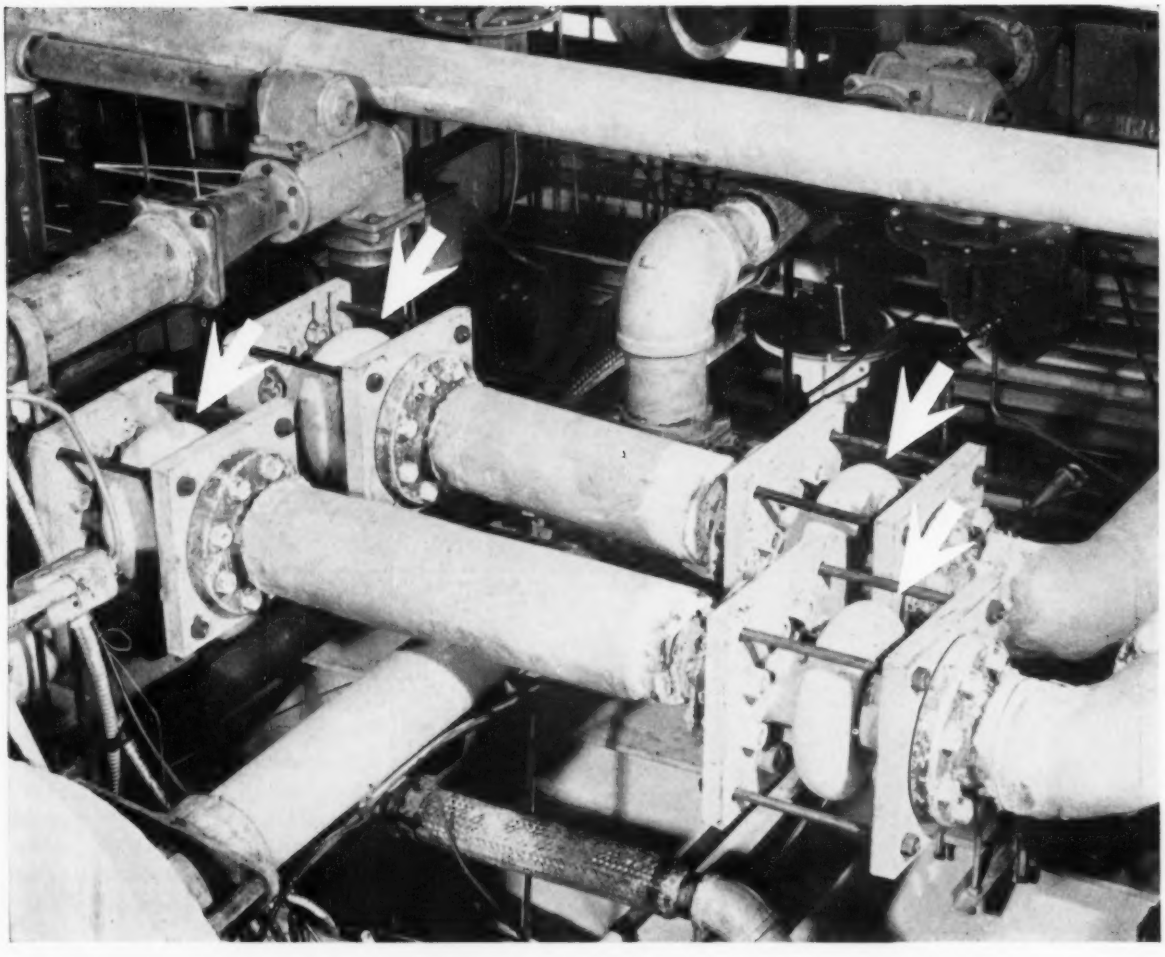
Prototype fan testing and computations for testing fan equipment are discussed in a 4-page bulletin. It tells how to test prototype (production unit) fans to get accurate performance characteristics for a complete series of fans of the same or larger sizes. Also covered are definitions of test ratings, deviations from the fan laws. (Air Moving & Conditioning Assn.)

For free copy circle No. 39 on postcard

OBI Presses

Facts on a new line of open back inclinable, mechanical gap presses are given in 4-page bulletin. Presses are 75, 100, 150 and 200-ton capacity models. (A. B. Farquhar Div., The Oliver Corp.)

For free copy circle No. 40 on postcard



"Only *Carpenter* Stainless Tubing gives us failure-proof service"

The manufacturer of these four truly maintenance-free packless expansion joints (shown by arrows, above) has tried other stainless tubing, but says Carpenter Stainless Tubing is the "only one that renders failure-proof service".

These joints absorb thermal expansion, operating at pressures up to 210 psi and temperatures up to 650°F. They are typical of expansion joints made from Carpenter Tubing which operate at pressures up to 10,000 psi or temperatures as high as 1800°F. Once installed, they have never been replaced. Some have been in service over 15 years. The quality and uniformity of Carpenter Stainless Tubing contributed greatly to the trouble-free fabrication and maintenance-free service of these joints.

If an extra measure of quality in stainless tubing and pipe can improve your products or operation, call your Carpenter Distributor. He's your nearby source of better stainless tubing and pipe.

MEMBER

The Carpenter Steel Company,
Alloy Tube Division, Union, N. J.

Export Dept.: The Carpenter Steel Co., Port Washington, N.Y.—"CARSTEELCO"

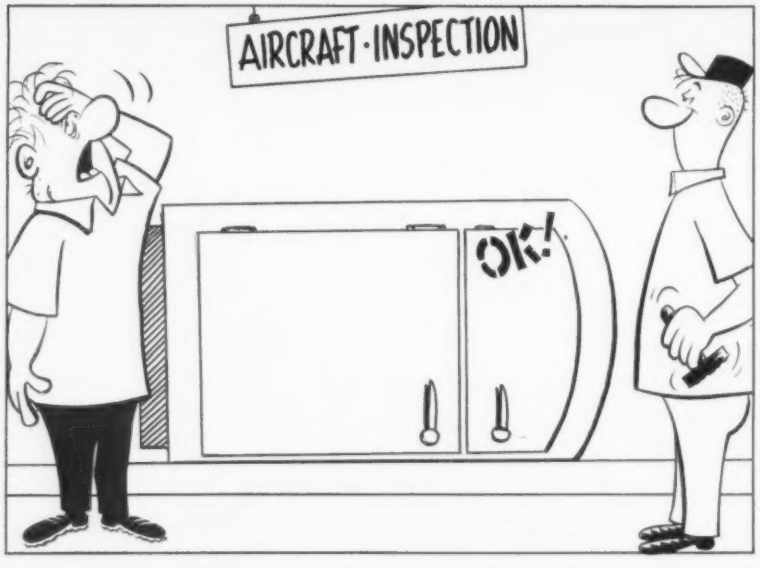
Carpenter

more than corrosion resistance

Stainless Tubing & Pipe

Like to spend more time reading and less time hunting?

Turn to pages two and three of **The IRON AGE** *and let the* **Digest of the Week in Metalworking** *help you find favorite features*



You Arbitrate It!

WHAT DO YOU INSPECT?

From The Files Of
The American Arbitration Association

Several years ago, management of a company making aircraft engines and household appliances negotiated a union contract. It provided, among other things, for "equalization of overtime among employees permanently assigned to an occupational group whenever practical and when the employees are qualified for the work." This clearly applied to a group of 27 employees, called "special inspectors," who checked the finished products against blueprint specifications.

Two years later, while still operating under the same contract, the company got some new orders for aircraft engines, requiring considerable overtime. On the other hand, there was a slump in household appliances. Management thought it reasonable under the circumstances to assign overtime on engines to the 16 inspectors who normally did this work during regular hours; the other 11 inspectors got overtime only once in a while when there was a rush order for non-aircraft equipment.

The union filed a grievance. "You're supposed to equalize overtime among all men classified as special inspectors," the international representative of the union pointed out. "For two years you applied the contract correctly. You can't change procedures now."

To this the plant manager replied: "In the past we had fewer products. We could afford to distribute the small amount of overtime hours among all. Now we've got to specialize. Besides, during overtime hours the inspector has to work on engines practically without supervision. We can't assign that to men who have been inspecting refrigerators all day."

The dispute was not settled in grievance procedure. It eventually went to an arbitrator.

The Arbitrator Ruled:

The essential issue, he said, was whether all "special inspectors" were qualified to work on aircraft engines and whether equalization of overtime was practical. He pointed out that the parties themselves, in setting up qualifications in their job

(Continued on following page)

NEW FILMS

"Making A Work Sampling Study" presents some management problems and shows some methods of solving them. It starts out with this: In a particular plant top management wanted to know the utilization factor for each of several production lines. Then it shows how work sampling delivered the answers. 23 min. 16-mm, sound, color and black and white. Educational Film Sales Dept., University Extension, University of Calif., Los Angeles 24, Calif.

"Color Magic" deals with the importance of color in industry and design. 22 min. 16-mm sound. Interchemical Corp., 67 W. 44th St., New York 36.

"Resistance Welding Stainless Steel" describes resistance welding via diagrams and animations as well as pictures of actual equipment in operation. It covers spot, seam, projection, flash, etc., processes. 21 min. 16-mm sound. Syndicated Films, 1022 Forbes St., Pittsburgh 19, Pa.

The Arbitrator Ruled:

(Continued)

rating system, acknowledged that all "special inspectors" were qualified to work on any assignment within their classification. As to the matter of practicality, the arbitrator admitted it would be more convenient for the company to do things its own way, and in the context of the agreement, practicality meant "workability" or "possibility." Since he wasn't convinced that the company found it "impossible" to abide by the contract, he upheld the union.

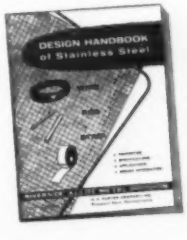
Caution: The award in this case is not necessarily an indication of how arbitrators might rule in apparently similar disputes. Each case is decided on the basis of the particular history, contract, testimony and other facts involved. Some of these essential details may have been omitted in condensing the original arbitration for brief presentation.

HOW RIVERSIDE-ALLOY HELPS YOU PICK THE RIGHT STAINLESS

VAST VARIETY—Knowing your problem, Riverside-Alloy can supply a stainless steel particularly suited to your needs . . . in wire, rod, or strip form. Or, lacking a stock steel, Riverside-Alloy will work with your engineers to develop new varieties.

SPECIAL STEELS—Riverside-Alloy can supply special stainless steels, too—fully soft or spring temper . . . magnetic or non-magnetic . . . for springs or staples, woven baskets or egg beaters, in just the size and finish you need.

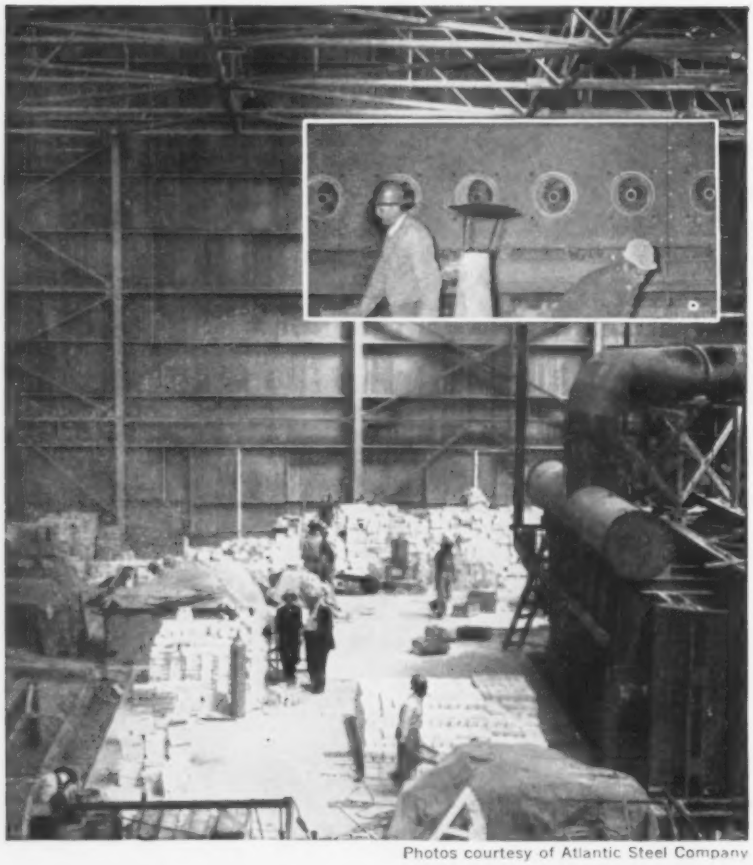
FREE CONSULTATION — Let a Riverside-Alloy representative discuss your problems with you. Since 1919, these steel specialists have been available for consultation and advice, without obligation. For the name of your nearest Riverside-Alloy representative, write, wire or call collect. *Alloy Metal Wire Works, Riverside-Alloy Metal Division, H. K. Porter Company, Riverside, N.J.*



FOR FREE CATALOG, "Design Handbook of Stainless Steel", write on your letterhead to the address above.

H. K. PORTER COMPANY, INC.
RIVERSIDE-ALLOY METAL DIVISION

Profitable Trends in the use of Refractories



Photos courtesy of Atlantic Steel Company

New furnaces start right with Laclede-Christy Refractories

Specifications on Atlantic Steel Company's new 13" Bar and Rod Mill included a 90 ton per hour reheating furnace. They called on a leader in the field, Rust Furnace Company, to build it. Rust's experience and knowledge prompted their use of Laclede-Christy refractories.

The installation included Spallac super-duty fire brick which has proved its long-lasting qualities in other installations . . . requiring minimum maintenance and reducing downtime. Spallac super-duty features high refractory value, good volume stability, and high resistance to spalling. Also included was Laclede King high duty brick.

To start your furnace right—for new or replacement installations, it pays to use Laclede refractories. Call Laclede-Christy Works, Refractories Division, H. K. Porter Company, Inc., St. Louis 10, Mo.

H. K. PORTER COMPANY, INC.
REFRACTORIES DIVISION

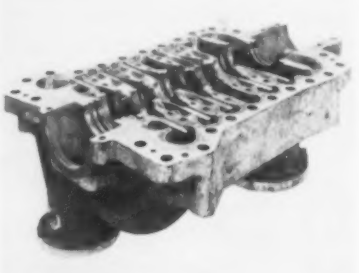
TECHNICAL BRIEFS

Produces Ductile Iron By New Process

In producing ductile iron, metallurgists pour the base iron over the master alloy in another ladle. However, magnesium in the alloy boils easily; so some gets lost in the air.

A new sealed-ladle process eliminates this. It also prevents loss of other alloying elements.

▪ Ductile iron castings can be produced more economically with less waste of alloying elements. This is the conclusion of metallurgists at Cooper-Bessemer Corp., Mt. Vernon, Ohio. Pilot runs in casting various diesel and gas engine components have been so successful that the firm is now turning out precision gears, generator shafts, precision sprockets and other parts by the sealed-ladle method.



This ductile-iron engine part is cast by the new system.

Known in Europe as the S-K-B (Schuchtermann & Kremer-Baum) process, the method is being li-

Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 81. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

censed by the International Nickel Co., New York. Cooper-Bessemer is one of the first licensees for the production of the material. The latter firm has pioneered many new and unusual uses for ductile iron.

Magnesium Boils Away—In this country nearly all ductile iron, or iron containing graphite in spherical form, is produced by alloying the base iron with magnesium in the form of a nickel, copper, or silicon master alloy. This is done by pouring the molten base metal over the master alloy contained in another ladle. Due to the ease with which magnesium boils, though, some of it gets lost in the air. It's this loss which the new process seeks to reduce.

Key to the new method's success is this sealed ladle unit.

In addition to losing magnesium, the associated metals in the master alloy are also added in quantity greater than necessary because of this loss.

However, metallurgists using the new method add pure magnesium to the molten iron in a sealed ladle. This prevents the magnesium from boiling; it thus confines the magnesium vapors.

Uses Pure Magnesium — Using pure magnesium obviously prevents the loss of the other metals used for alloying in the regular process. Furthermore, by this method enough magnesium can be added to produce the spheroidal graphite when the treated metal is

inspection...

is this your wire rope problem?

Safety and economy can be greatly improved by methods described in LESCHEN RED-STRAND BULLETIN NO. 104

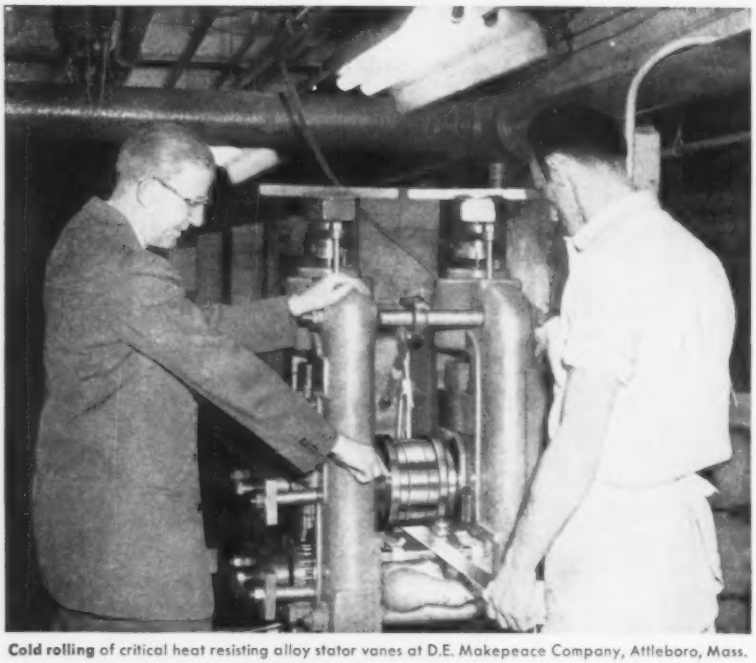
Without adequate inspection, a severely damaged rope might remain in service until sudden failure and thus bring disaster. Such danger will be foreseen and adequate safety measures adopted in plenty of time, however, wherever a well organized program of periodical inspections is maintained. Bulletin No. 104 gives detailed instructions for setting up and maintaining such a program, tells what to look for and what findings mean. Copies sent free on request. Write to H. K. Porter Company, Inc., Leschen Wire Rope Division, St. Louis 12, Mo.

LESCHEN Red-Strand WIRE ROPE

H. K. PORTER COMPANY, INC.

LESCHEN WIRE ROPE DIVISION

Proof of Vulcan Tool Steel Superiority



Cold rolling of critical heat resisting alloy stator vanes at D.E. Makepeace Company, Attleboro, Mass.

Vulcan Service PLUS TCM Steel solves tough rolling problem on jet stator vanes

Vulcan sales engineers, working closely with the tool experts of D. E. Makepeace, faced a tough and exacting problem: How to increase the service life of rolls used in cold rolling critical jet engine heat resisting alloy stator vanes.

As a result of joint investigations, design changes were recommended and adopted. The result? Roll life was multiplied.

Vulcan engineers went further. Despite the fact that other grades of tool steel had been tried and found unsatisfactory, Vulcan engineers predicted that *additional* improvements could be made by using Vulcan TCM steel. This recommendation, too, was adopted. The result? The already increased roll life was *trebled*. Net result: substantial savings with increased roll life, less down time and greater productivity.

This same engineering help is available to you without charge. For the name of your nearest Vulcan representative, write, wire or call collect. Vulcan Crucible Steel Division, H. K. Porter Company, Inc., Aliquippa, Pa.

H. K. PORTER COMPANY, INC.

VULCAN CRUCIBLE STEEL DIVISION

diluted with large quantities of hot, untreated base metal.

The new method was first demonstrated in this country at Cooper-Bessemer's foundry this fall. More than 300 metallurgists and foundrymen representing licensed organizations witnessed the demonstration.

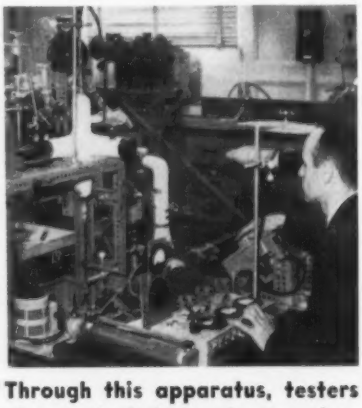
Photography Measures Rate of Corrosion

How fast does a particular corrosive gas attack a certain solid surface? The answer to this can be gotten via a new time-lapse photographic technique.

Developed at the National Bureau of Standards, the new method affords researchers a permanent record of a corrosive reaction's progress at specific time intervals. From the photos they measure dimensional changes. It's then a simple matter to figure the sample's rate of change of mass.

Method Is Quick—The technique is rapid and relatively easy to use. And it has the added advantage of being applicable to any of a large number of gas-solid reactions.

Few studies of gas-solid reactions involving volatile products have been



Through this apparatus, testers view and photograph corrosion.

conducted even though reaction rate measurements for such systems provide valuable information on the mechanism of corrosion. At high temperatures encountered in these studies, severe experimental

complications arise. The time-lapse photographic method offers a convenient solution to many of these problems, says the bureau.

Since the photographic method doesn't depend on any chemical or physical properties of the reactants, it offers several conveniences. For example, surface temperature measurements are made at the same spot upon which the camera focusses. This eliminates not only the problem of maintaining a large surface at a uniform high temperature but also that of measuring the area of reacting surface. With this method the gas and metal surface may also be heated independently, and maintained at either the same or different temperatures.

So-called Safe Tools Can Cause Explosion

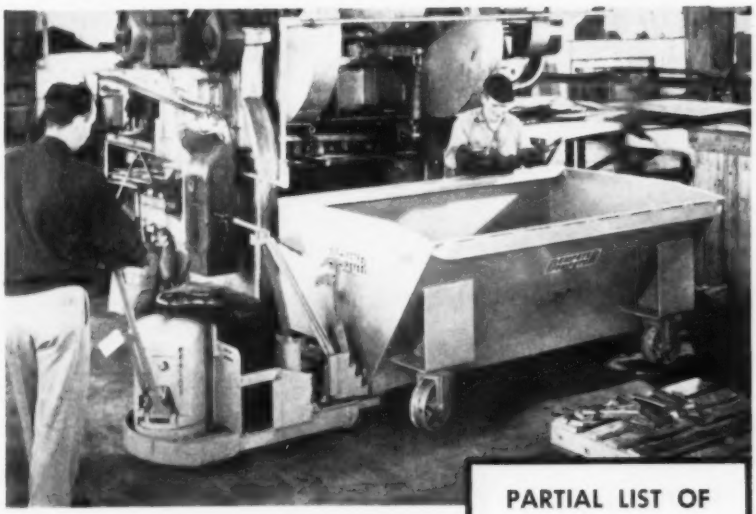
"Non-sparking" hand tools are no more effective than those of steel in preventing accidental ignition of explosive or combustible atmospheres. That's the conclusion of a Navy report just released.

The conclusion was reached during a survey of sparking characteristics and safety hazards of metallic materials. Researchers found sparks or impacts and subsequent ignitions can result from use of low sparking materials such as copper. They also report that metallic sparks can be produced by contact between a nonsparking and a sparking metal.

Impact Is Hazardous — Another significant result is the observation that nonmetallic sparks can be produced by low velocity impact of metal on quartzitic rock. Impact was indicated as a more hazardous source of ignition than friction sparks, particularly in firedamp, or methane-air.

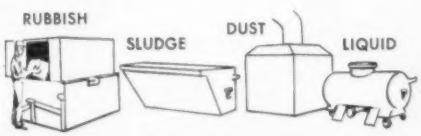
Copies of the report, including discussions of the fundamentals of sparking theory and methods of spark testing, are contained in PB 131131. It's available from OTS, U. S. Dept. of Commerce, Washington 25, D. C. It contains 36 pages; price $1.

Industrial Leaders "CONTAINERIZE" Waste As It Accumulates



Dempster-Dumpster System Provides Temporary Storage at Points of Waste Accumulation

Enclosed temporary storage of waste is the key to plant cleanliness and low-cost disposal. Clean Dempster-Dumpster Containers, placed at major inside and outside waste accumulation points, perform this vital function. Costly rehandling is eliminated; one man and one truck-mounted Dempster-Dumpster dispose of all waste from your plant . . . picking up, hauling and dumping containers on a planned shuttle schedule. This low-investment System generally pays for itself in 18 months or less.



WRITE TODAY for your free copy of the new manual, "How to Cut Industrial Waste Disposal Costs."

Dept. IA-1, DEMPSTER BROTHERS, Knoxville 17, Tenn.

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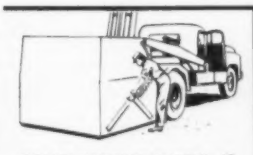
U. S. Gypsum
U. S. Rubber Co.
U. S. Steel
Westinghouse

THE DEMPSTER DUMPSTER SYSTEM



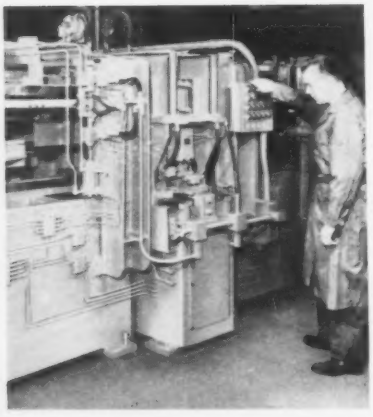
CONTAINERIZED WASTE IS PICKED UP . . .

HAULED . . .

. . . AND DUMPED

New Production Ideas

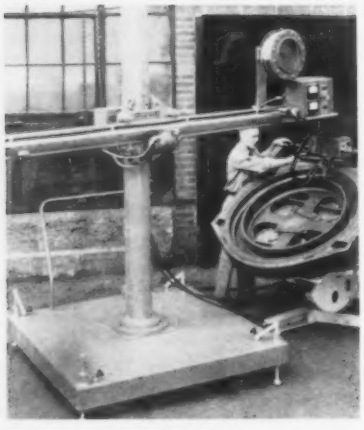
Equipment, Methods and Services



Broaching Machine Handles Parts Automatically

This horizontal broaching machine automatically works cylinder-block bearing surfaces. Designed for automated engine lines, the unit features mechanized handling of parts in and out the work station. Work moves through the broaching station from left to right, in an opposite direction to the cutting stroke of the broach. The machine is rated at 7-ton capacity with a 66-in. stroke. The entire broaching cycle is completely automatic. Parts to be broached are fed into the loading station located at the left side of the machine. The unit's hydraulic system offers a 40-pct safety overload margin above the machine capacity. This reduces shock, cuts vibration and tool chatter, besides giving reserve power when needed. Hydraulic power is furnished by a rugged vane-type pump. All controls are interlocked. (Colonial Broach & Machine Co.)

For more data circle No. 41 on postcard, p. 81



Mobile Manipulator Fits Many Welding Jobs

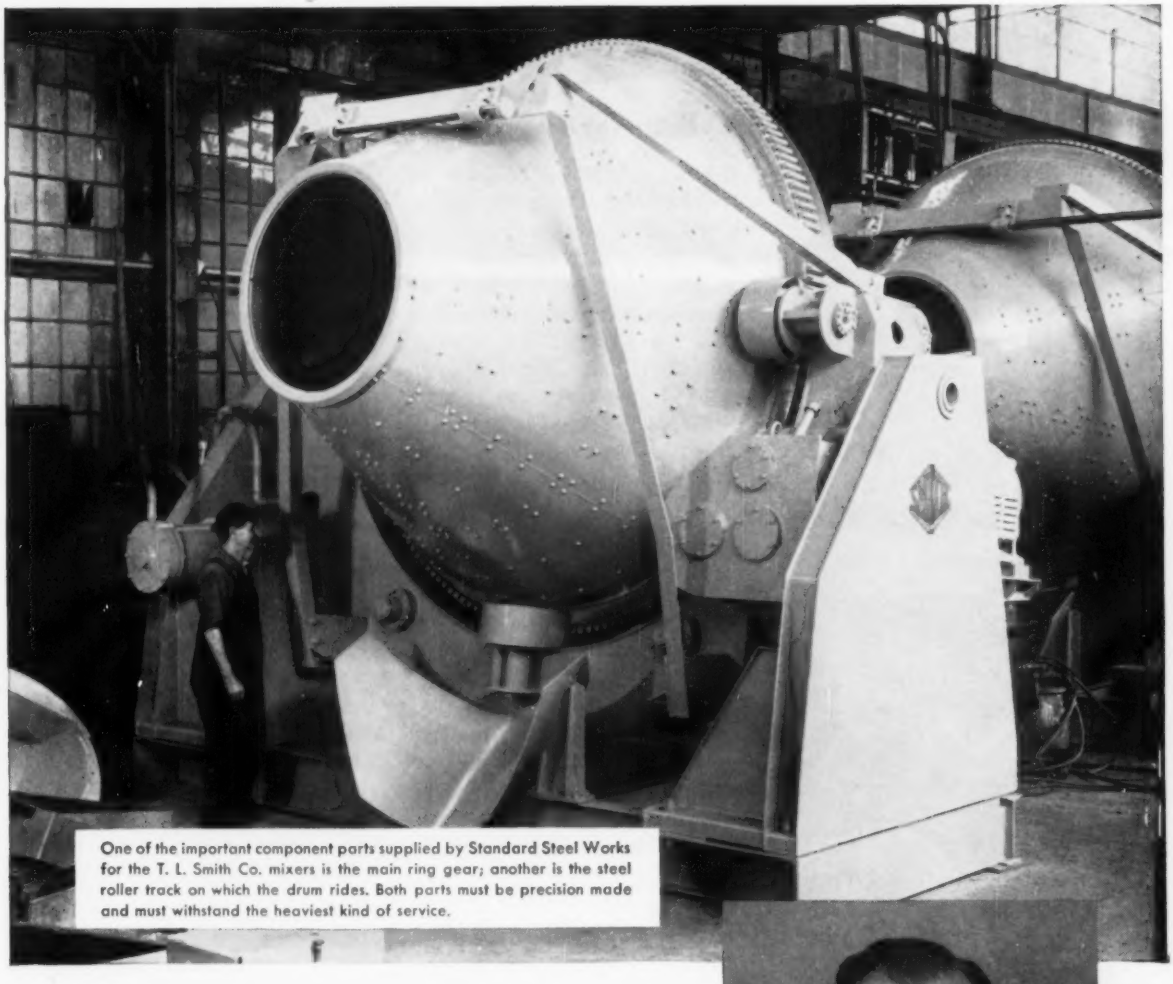
Designed to position and pilot standard automatic welding heads with high accuracy is this automatic welding head manipulator. It's one model in a new series. These mobile machines are recommended for shops handling medium-size fabrications (i.e., sub-assemblies), small production runs, or special jobs. They are primarily for use with work-holding positioners or turning fixtures. The units weld straight seams up to 8-ft long; they allow 8-ft under-boom clearance. Features of the manipulator include: 360° rotation of the boom, infinitely variable welding speeds up to 87 ipm; a base with integral wheels for ready mobility. It handles up to 250-lb boom-tip loads with consistent accuracy. Longitudinal boom travel is controlled by an electrically-driven mechanical variable-speed transmission. (The Lewis Welding & Engineering Corp.)

For more data circle No. 41 on postcard, p. 81

Environment Tester Has Wide Temperature Range

Custom-built, this environmental test machine adjusts from —50 to +200°F. It maintains a relative humidity of 95 pct, ±5 pct between 80 and 160°F. To eliminate the necessity of connecting to the city's water supply, the humidity element is supplied by a distilled water-air pressure reservoir, controlled by a solenoid valve. Temperature and humidity control is provided by a Brown two pen wet and dry bulb recording controller. The unit has a net clear working area 24 in. high by 24 in. wide by 19 in. deep. Air circulation and heat are provided by a fan coil and blower assembly on the back wall. The chamber is 14 gage stainless steel, ball corner construction, with full access to the chamber area provided by a front-opening door. The single-stage refrigeration system is equipped with a 1 hp hermetic motor compressor which operates on 230-v, 60 cycle, single phase current. (Cincinnati Sub-Zero Products)

For more data circle No. 43 on postcard, p. 81



One of the important component parts supplied by Standard Steel Works for the T. L. Smith Co. mixers is the main ring gear; another is the steel roller track on which the drum rides. Both parts must be precision made and must withstand the heaviest kind of service.

"The T. L. Smith Co. is constantly seeking design improvements and production economies. Standard Steel Works has proved a big help to us in both respects."

As suppliers of component parts to the T. L. Smith Co.—world's oldest and largest manufacturer of concrete mixers—we have made it *our* business to get to know *their* business well enough to consider ourselves a part of their team.

It is our policy to work in the closest possible cooperation with all of our customers to assure maximum quality at lowest possible cost. Let us discuss your casting and forging needs with you. You'll find that service to our customers is as important as the quality of the products we make. Write Dept. 1-A.

"We are particularly impressed with Standard's methods-people and the way their engineers so effectively supplement our own in constantly suggesting design improvements and production economies," says R. R. Kupfer, purchasing agent for the T. L. Smith Co., Milwaukee, Wis.

Standard Steel Works Division

BALDWIN · LIMA · HAMILTON

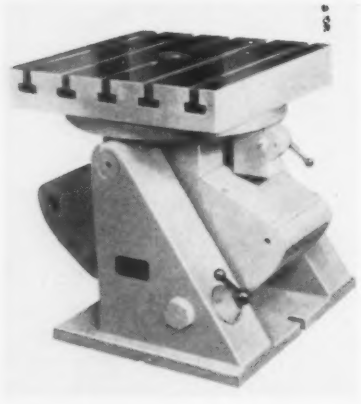
BURNHAM, PENNSYLVANIA

Rings • Shafts • Car wheels • Gear blanks • Flanges • Special shapes

Flat Finisher Works Sheet, Plate, Bar Stock

A new flat finisher is built for wet abrasive belt grinding, polishing and deburring of flat work such as sheets, strips, bars, stampings, plates, etc., up to 6 in. wide by 6 in. high. Heavy duty construction throughout and an endless conveyor belt with variable speed control makes the unit useful for high volume, continuous production, according to the manufacturer. It's available with a single head, or, if several operations are necessary, it comes as a multiple head machine. The abrasive belts are carried by two rolls; a powered contact roll and a tracking idler. Vertical adjustment is manually controlled and tensioning on the idler roll is maintained by adjustable air pressure. Head motors up to 7½ hp are available. An electro-magnetic platen holds material on the conveyor belt. The magnetic force is variable to suit size or mass of the work. (Hammond Machinery Builders)

For more data circle No. 44 on postcard, p. 81



Work Positioner Adapts to Many Jobs

A new heavy-duty worktable for radial drilling, tapping, and boring, incorporates the means for both angular and radial positioning of workpieces. In addition to providing 360° rotation and eight equally spaced radial locating holes, the cradle-type design of the new table permits tilting work in a number of different planes, from horizontal to vertical. This makes it possible to perform an almost unlimited number of machining operations on a wide range of work. For example, on a radial drill, five surfaces of a rectangular workpiece can be machined without relocating or reclamping. The standard table is 20 in. square x 3 in. thick. The table is supported by a 2¾ in. x 10 in. precision-ground pin, mounted in two large precision bearings. (Galger Engineering & Mfg. Co.)

For more data circle No. 45 on postcard, p. 81

Custom-made Baler Meets User's Needs

In keeping with the idea, "Design for the customer what he wants instead of selling him what you have already built," a manufacturer has produced this scrap metal baler. Of custom design and manufacture to a customer's requirements, this baler takes into consideration such things as site, best loading method, best ejection method, etc. Only after a thorough study, and with all the pertinent facts at hand, did the maker's engineers design this machine. It takes its charge in a ground-level charging box, 5 wide x 6 deep x 12 ft long (long enough for an auto body from cowl back—less the frame at the customer's request). In four stages, the unit compresses load into a high density bale approximately 18 x 20 x 30 in. It then ejects the bale, by flipper, to within a few feet of a railroad spur track. Or, if the bales are to be stored, they can be deflected for loading on a conveyor. (Superior Machine Co.)

For more data circle No. 46 on postcard, p. 81

Carbide Drills Come In All Popular Sizes

Carbide tipped and solid carbide twist drills in one maker's line are designed for drilling various types of non-metallic and non-ferrous materials. They are available from stock in all popular styles and sizes. These tools also perform well on many cast iron applications and on some steels where chip forming conditions are satisfactory. (National Twist Drill & Tool Co.)

For more data circle No. 47 on postcard, p. 81

Best Seller

Those who know say people are reading more books than ever before. But they are not reading so much for entertainment as to be better informed. In a recent 12-month period, the first 10 nonfiction best sellers outsold the first 10 fiction best sellers by some million and one-half copies.

This hunger to be better informed applies to the magazine field, too. It accounts for the keen and mounting interest in trade and industrial publications, where fiction is unknown . . . where your advertising message can be a part of the nonfiction so eagerly sought.

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COMPANY

Chestnut and 56th Streets • Philadelphia 39, Pennsylvania

CHILTON PUBLICATIONS: Department Store Economist • The Iron Age • Hardware Age • Spectator • Hardware World Jewelers' Circular–Keystone • Automotive Industries • Gas • Distribution Age • Optical Journal and Review of Optometry Motor Age • Boot and Shoe Recorder • Commercial Car Journal • Butane-Propane News • Electronic Industries • Book Division

NEW: ***Man-made Giraffe***

Unique Aerial Platform Moves On Cylinders Made From Pittsburgh Tubes

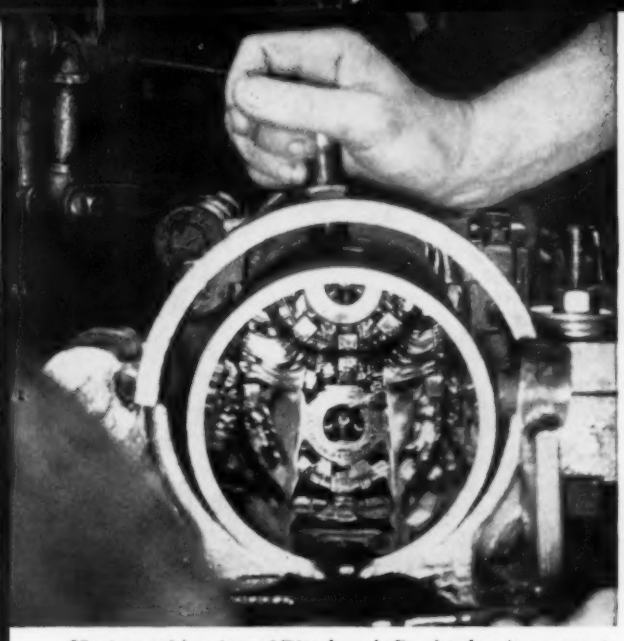
Giraffes are big business at Pitman Manufacturing Company.

Not the giraffes of the animal kingdom but ingenious hydraulic aerial platforms. These mechanical "Giraffes" are used for anything from de-icing a giant Air Force bomber to fighting fires in tall buildings.

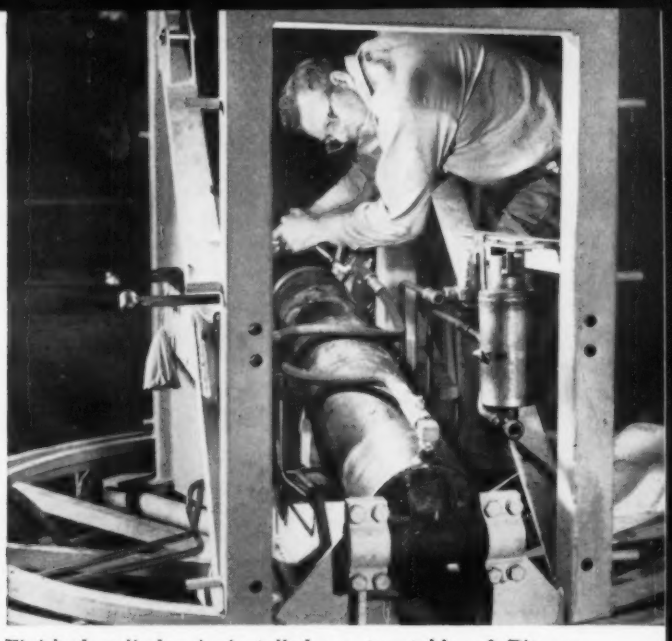
Pitman's truck-mounted Giraffes depend on hydraulic cylinders made exclusively of Pittsburgh Steel Company's seamless mechanical tubes. Giraffes are finding wide acceptance in varied industries because:

- Workmen can reach heights up to 65 feet in a fraction of the time and cost required by other methods. And their tools go up right with them.
- The roomy, insulated platform carries two men who can control all platform movements with controls duplicating those on the ground.
- The aerial platform can rotate a full 360 degrees in either direction in a radius as great as 35 feet.
- The largest of three models permits the 31-foot upper boom to move in a 160-degree vertical arc. The 23-foot lower boom can move in an 80-degree arc, so workmen can reach the exact spot they want.
- Hydraulic outriggers, operated independently, are raised or lowered by moving hand levers at side of truck.

Since hydraulic cylinders are vital to safe, dependable, economic operation of the Giraffe, Pitman makes its own cylinders with great care.



Horizontal honing of Pittsburgh Steel tubes is an exacting process. Inside the tube, you can see part of the hones. At the end of the tube, the hones are mirrored on polished steel.



Finished cylinder is installed on turntable of Pitman Giraffe. This cylinder supports and moves the lower boom. Completed Giraffe will be mounted on truck supplied by customer.

All Giraffe hydraulic cylinders are made from tubing produced by the Tube Mills of Pittsburgh Steel Company and sold by the Kansas City distributor, Metal Goods Corporation.

"We get high production from tubes because Pittsburgh tubes hold to close tolerances," declared Arthur Moore, vice president and general manager of Pitman Manufacturing. He added:

"We give Pittsburgh Steel tubes credit for cutting our scrap losses. But economy isn't all we're thinking of. Since we never forget that men's lives depend on our cylinders we build a safety factor of at least three into every cylinder. We've never had a burst cylinder or a cylinder wall failure with Pittsburgh tubes.

"Finally, Pittsburgh Steel gives us the kind of service we like."

Mr. Moore said engineers from Pittsburgh Steel helped analyze the company's tube problems, suggested some design changes and took Pitman's prints back to the mill to make tubing which exactly fills the bill.

"The service which Pittsburgh Steel instituted ended our tubing problems," said Mr. Moore. "Our cylinders have been very satisfactory ever since."

Whether you make hydraulic cylinders or use seamless mechanical tubing in another application needing uniformity, close tolerances and engineering help, you can profit by Pitman's experience.

Start today by getting in touch with trained help available through any Pittsburgh Steel Company District Office or from one of the Pittsburgh Steel distributors listed at right.

Fire-fighting is just one of many uses for the Pitman Giraffe. These firefighters can move their platform to any given spot quickly and easily without losing time when time counts most.

Pittsburgh Seamless Distributors

Baker Steel & Tube Company
Los Angeles, California

Chicago Tube & Iron Company
Chicago, Illinois

Cleveland Tool & Supply Co.
Cleveland, Ohio

Drummond McCall & Co., Ltd.
Montreal, Quebec, Canada

Edgcomb Steel Company
Philadelphia, Pennsylvania

Gilmore Steel & Supply Co.
San Francisco, California

Earle M. Jorgensen Co.

Perry Kilsby, Inc.
Los Angeles, California

Mapes & Sprowl Steel Co.
Union, New Jersey

Metal Goods Corporation
St. Louis, Missouri

Miller Steel Company, Inc.
Hillside, New Jersey

A. B. Murray Co., Inc.
Elizabeth, New Jersey

C. A. Russell, Inc.
Houston, Texas

Ryerson, Joseph T. & Son, Inc.
Chicago, Illinois

Solar Steel Corporation
Cleveland, Ohio

Steel Sales Corporation
Chicago, Illinois

Tubular Sales
Detroit, Michigan

Ward Steel Service Company
Dayton, Ohio

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

District Sales Offices

Atlanta, Chicago, Cleveland, Dallas, Dayton, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Tulsa, Warren, Ohio

STEEL MEN!

FIGURE THE VALUE OF A BALANCED TANK

THE ideal glass furnace is one which can be counted on to wear out evenly and uniformly, giving the operator the *full* potential value of every brick in every part of the tank.

Until a few years ago, however, such a tank was considered an obvious impossibility.

When Corhart Electrocast was first offered to the trade as a much superior glasshouse refractory, our new customers began using it to strengthen those portions of their furnaces which had always been the limiting factors in producing life.

This idea proved successful, but at the end of the fire, the Corhart was usually in such good shape that the natural result was to fortify the next weakest portions. This step-by-step process has now been followed through to its logical conclusion by most of our original customers: namely, the gradual increase of Corhart to a point where the life of the former weak portions approximates the life of the easy-service portions. This ideal construction, with the judicious use of Corhart Electrocast, has led to what is termed "The Corhart Balanced Unit."

A Corhart Balanced Unit can be fabricated for a surprisingly small percentage increase in first cost. *This percentage increase represents only a fraction of the increased life and total tonnage output.*

Corhart Balanced Tanks are now widely used throughout the industry. *More than sixty are now in service*—and this, of course, is in addition to the dozens of installations in which Corhart is used as a spot refractory. Write us today for the complete facts and figures on a Corhart Balanced Tank of *your* company's type. Full designs, specifications and quotations will be gladly furnished, without obligation. *Address:* Corhart Refractories Co., *Incorporated*, 16th & Lee Sts., Louisville, Ky.

QUALITY ECONOMY ENDURANCE

CORHART ELECTROCAST REFRACTORIES

THIS ad appeared more than 25 years ago—in January, 1932. At that time Corhart Electrocast was still so new in the glass industry that only a few of the most progressive companies dared buy it. It was, *and still is,* "one of the world's highest-priced refractories". Yet now its use is practically universal . . .

Today Corhart 104 is new in the steel industry. Like its glass-industry counterpart, it too is "one of the world's highest-priced refractories". Yet it offers open-hearth furnace operators the same opportunities for greater production and lower costs that Corhart Electrocast brought to the glass industry.

May we send you all the facts? Address: Corhart Refractories Co., *Incorporated,* 1620 West Lee Street, Louisville 10, Kentucky, U.S.A., SPring 8-4471.

QUALITY ECONOMY ENDURANCE

CORHART 104 ELECTROCAST REFRACTORY

The words "Corhart" and "Electrocast" are registered Trade Marks which indicate manufacture by Corhart Refractories Company, *Incorporated.*
Corhart Refractories Co., *Incorporated,* 1600 West Lee Street,
Louisville 10, Kentucky, U.S.A.—Telephone SPring 8-4471.

The Iron Age Summary

Mills Trim Sails in Dull Market

Steel firms admit short-term outlook is bad. They hope for best but prepare for worst.

Full-fledged recession is ruled out, but no one's guessing when upturn will come.

■ Steel men have quit kidding themselves about the short-term market outlook. They admit it's going to be bad, although they take some comfort in the thought that it can't get much worse.

Typical of mill thinking at the moment are these comments from steel salesmen:

"We're looking for a pickup next month, but that's what we've been saying for some time," says one. "The second quarter should be better, but maybe it won't; maybe it will be worse," adds another.

Sail Trimming — The mills are trimming their sails until the storm of inventory-cutting and slow buying shows signs of abating. Most of them have quit trying to guess the month in which it will come. Instead they are waiting for a definite reversal of form.

Meanwhile, steel firms are laying off workers, cutting out overtime, and shutting down melting furnaces and rolling mills. Retrenchment is the by-word. Coupled with this attitude is some of the hardest selling in steel in years. Salesmen and production men are dove-tailing their operations to pin down sales they would have turned down in mid-1957.

No Recession Seen—But despite the current sour tune of the market, the mills are convinced they are not in for a full-fledged recession. They don't know when the turn for the better will come, but they know it will—perhaps as early as the second quarter.

Most of the bad news is coming from Detroit. The automakers are sitting on their hands until their own market outlook clears up a bit. They know they can get quick delivery when they want it and are playing out the role of the reluctant suitor.

Auto Outlook—The automotive steel market may come to life about midway in second quarter. Most observers of the auto labor scene figure that the odds favor a strike over union demands in the mid-year contract negotiations. This, they figure, will prompt the carmakers to stock up on new models as a hedge against a possible shutdown. Recent comments of auto executives indicate they will take a firm stand on the expected demands of the auto union.

Another hopeful note for steel is the probable effect of stepped-up defense spending this year. There is reason to believe that defense outlays will run even higher than those mentioned to date. This, of course, will affect the outlook for metalworking and, in turn, the outlook for steel. To some extent it already has stemmed the decline in manufacturers' orders.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week 1,562	Last Week 1,498	Month Ago 1,792	Year Ago 2,586
Ingot Index (1947-1949=100)	97.2	93.2	111.5	160.9
Operating Rates				
Chicago	60.0	65.0*	72.0	97.0
Pittsburgh	54.5	49.5*	66.5	100.0
Philadelphia	71.0	45.0	84.0	104.0
Valley	51.0	33.0*	57.0	100.0
West	74.0	70.0	80.0	100.0
Buffalo	51.0	56.0	63.5	105.0
Cleveland	48.0	57.0*	67.0	99.0
Detroit	66.0	73.0*	89.0	105.0
S. Ohio River	64.0	68.0*	72.0	104.0
South	62.5	71.0	67.0	95.0
Upper Ohio R.	57.0	57.0*	63.0	103.0
St. Louis	86.0	76.0*	60.5	96.0
Northeast	31.0	31.0	31.0	48.0
Aggregate	61.0	58.5	70.0	101.0

*Revised

Prices At a Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.967	5.967	5.967	5.622
Pig Iron (Gross ton)	$66.42	$66.42	$66.42	$62.90
Scrap, No. 1 hvy (Gross ton)	$33.00	$32.83	$32.00	$60.83
No. 2 bundles	$24.67	$24.50	$24.00	$48.50
Nonferrous				
Aluminum ingot	28.10	28.10	28.10	27.10
Copper, electrolytic	27.00	27.00	27.00	36.00
Lead, St. Louis	12.80	12.80	12.80	15.80
Magnesium ingot	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin Straits, N. Y.	93.00	92.625	90.25	99.50
Zinc, E. St. Louis	10.00	10.00	10.00	13.50

Fastener Makers Stress Quality

Industrial fastener manufacturers know that ever-improving products help users do a better job with less maintenance.

They're working hard on the problem of increasing fastener reliability.

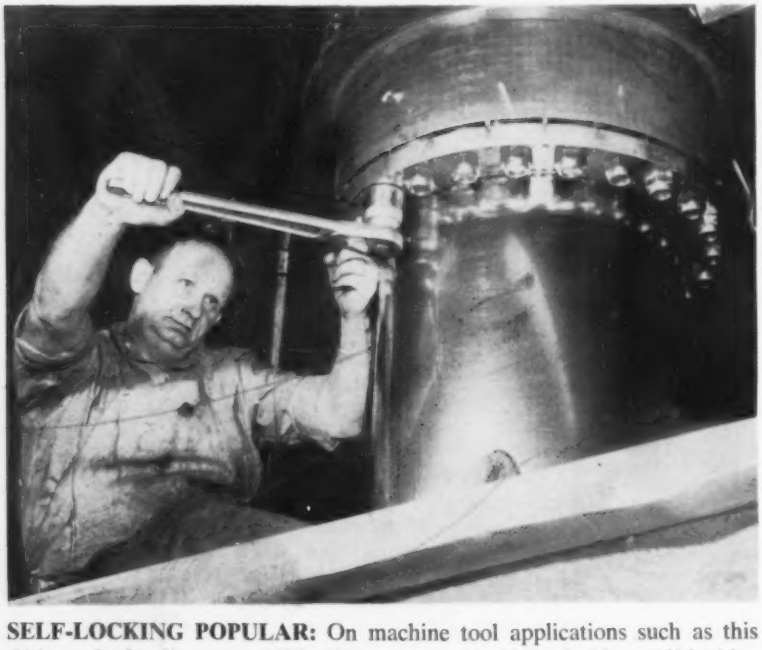
■ "Government, industry, science, the military and the consumer are all demanding fasteners that will perform more reliably to keep repair and replacement costs down and at new extremes of operating conditions," says H. Thomas Hallowell, Jr., president of Standard Pressed Steel Co., Jenkintown, Pa.

"Technological advances, the trend toward miniaturization, industrial automation and growing consumer complaints against the $16 million annual repair and maintenance bill spur the trend toward improved reliability," he adds.

Aircraft Leads Way—Other industrial fastener producers maintain quality in fasteners is receiving continued emphasis especially for aircraft and missile specialty types.

"We have published an acceptance quality level since 1952 and a good deal of fastener purchasing standards are being based on it," says W. C. Stewart, technical advisor to the Industrial Fasteners Institute in Cleveland.

Quality Control Pushed—"The aircraft and automotive industries have had higher standards for some time, but the trend is now spreading to farm equipment," he points out. "Most larger companies are purchasing according to rigid standards and this practice is receiving increased acceptance from industry."



SELF-LOCKING POPULAR: On machine tool applications such as this 500-ton hydraulic press self-locking nuts are traditional. Now self-locking fasteners are also in demand. (Standard Pressed Steel Co. photo.)

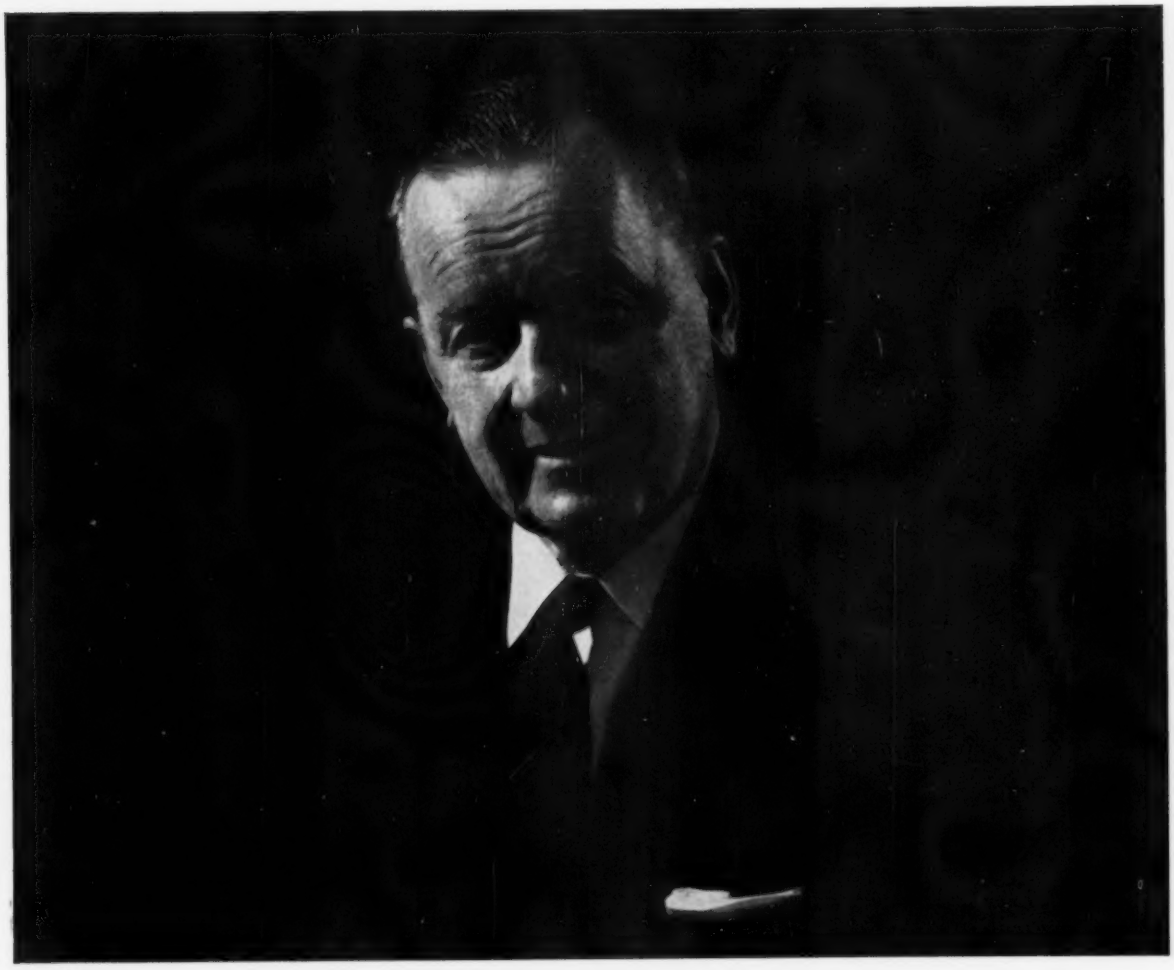
One of the largest producers of fasteners, Lamson and Sessions of Cleveland, has been an industry leader in quality control with a statistical quality control laboratory headed by a college professor. Another manufacturer states that among automotive and appliance users of fasteners there's a trend toward single-piece time saving units.

Three Labs Ready—In line with the quality trend, Standard Pressed Steel Co. this month is opening three screw thread measuring laboratories in Jenkintown near Philadelphia, at Cleveland and Los Angeles costing $300,000 each. These are intended to help industry reduce production losses resulting from fastener assembly problems. Basic services will include analyzing fastener fit problems, checking and setting up screw-thread inspection gages with highly accurate equipment and setting up reliable inspection gaging systems in conformance with recognized thread standards.

Maintenance Is Spur—The aircraft industry is one showing the way to the possibilities of precision fasteners, Mr. Hallowell feels. Reliability there has been improved to the point where designs in some areas need a margin of only 15 pct while most other industries are using 800 and 1000 pct.

Maintenance savings are another big incentive. It has been estimated that it costs 10 times the initial price to maintain military electronic equipment for its lifetime. SPS estimates a cost of $20 just to replace or tighten a lost or loose screw or nut on a service call, figuring in all costs and inconveniences involved.

In addition to quality, fastener customers now want fast delivery, so local distributors are enlarging their inventories to meet demand.



T. S. PETERSEN

"Investing in America has made our country great"

"The American competitive enterprise system was founded on the work and savings of the people and has produced the highest standard of living in history.

"Our people of their own free will have made all forms of investment from Government Savings Bonds to venture capital for new enterprise. Competitive enterprise is dependent on the continued supply of these funds, which benefit consumers, workers, and the national interest.

"Investing in America through Savings Bonds and venture capital has helped make our country great and this idea needs to be brought home to all the people."

T. S. PETERSEN, *President,*
Standard Oil Company of California.

If your employees do not enjoy the advantages of the Payroll Savings Plan—or if participation is less than 50%—act right now. A letter to Savings Bonds Division, U.S. Treasury Department, will bring prompt assistance from your State Director. He will help you put an application blank into the hands of every employee. It requires a minimum of effort—and it is a gesture that will win the approval of the people in your company.

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The IRON AGE

User Caution Brings Order Setbacks

Deferments and cancellations from steel buyers are unwelcome news at the mills.

Even heavy plate affected as some fabricators move to trim their inventories.

▪ Order setbacks and cancellations continue chilling the steel market atmosphere.

Automotive steel buyers—carefully matching purchasing to actual production schedules—are accounting for most of the setbacks in the flat-rolled products. They are sending through deferments on January tonnages. In some cases February orders, too, are being held up.

The order shuffling often gives mills scheduling headaches. Sometimes they proved worthwhile. In one case a mill went ahead with a customer request to postpone some tonnage until next month. Then the buyer called back the same day and wanted fast delivery on a larger order of the same product.

Warehouses Pare Stocks—However automotive buyers are not the only ones stepping softly when it comes to ordering. Warehouses, intent on paring down their stocks by 5 or 10 pct this month and next, are also swinging the ax. They are going very slow on hot, cold, and galvanized sheet orders, as well as on bar, stainless and light plate.

Stainless producers are getting a double dose of inventory paring. Both warehouses and industrial users are cutting stainless stocks. Since a high percentage of stainless passes through warehouses for re-sale the cutbacks are compounded.

Even heavy plate is getting into the cancellation act. Inventory cutbacks by plate fabricators of tanks and heavy machinery are being felt by the mills. In addition, producers turning plate into linepipe are running into cancellations for this quarter. With the long-range outlook for linepipe still good, some are turning to the export market to place current tonnages.

Sheet and Strip—Mills will be unable to point to holiday lulls in January to explain slow sales. The month for many of them will only just about equal December. In some cases producers expect January tonnages to fall a shade under those of the preceding month. Automotive buyers continue ordering on a hand-to-mouth basis, matching steel needs to weekly production schedules.

Shifting around of tonnages is also annoying to the mills. One **Eastern** mill had a February order deferred and a few hours later picked up another February order for larger tonnage from the same buyer. Cancellations from automotive buyers are hurting **Midwest** mills. Some sheet producers there, are on as little as seven turns a week.

PURCHASING AGENT'S CHECKLIST

Steel scrap industry is cutting corners and holding on as it sweats out market slump. **P. 22**

Market competition isn't worrying tinplate producers. **P. 28**

Machine tool builders looking hopefully for sales upturn. **P. 45**

Warehouses in both the **East** and **Midwest** are doing little buying for January or February as they cut inventories.

Plates and Shapes—Producers in the **Pittsburgh** area are current on orders after some mills blanked out December rolling schedules. Plate fabricators are expected to continue inventory cutbacks through the first quarter. Then a pickup is expected. Mill bookings are off, with one **Eastern** producer believing February plate activity will be under sheet and strip levels. A mill which converts plate into linepipe is seeking export orders to plug gaps in schedules left by domestic user cutbacks. **Chicago** area mills also note a weakening in the fabricated plate market.

Bars—Implement manufacturers are providing the only spark in the sluggish hot-rolled bar market. But their return is more than offset by the lack of ordering from cold-finishers and others. New cancellations on bar are coming in from automotive, appliance and warehouse buyers. January business is expected to be no better than December's at many mills. Customers are getting delivery in less than processing time by shopping around for scheduled rollings of the sizes they want.

Stainless—Both warehouses and plants in the **Pittsburgh** area are cutting stainless stocks. Mill shipments there are lagging as producers feel the impact of this reduction in ordering. Defense orders for stainless are not yet helping the market. Mills at **Detroit** indicate auto trim manufacturers are continuing to order rush tonnages, then retire from the market for a while. Little stainless is going into inventory.

Foreign Steel—Importers predict a growing influx of foreign bar and reinforcing bar following price decreases at French and Benelux mills. Customers in the **Midwest** are already inquiring about it. Importers also expect a spring pickup in 6, 7, and 8-in. beams.

COMPARISON OF PRICES

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**; declines appear in *Italics*.

	Jan. 7 1958	Dec. 27 1957	Dec. 3 1957	Jan. 8 1957
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.925¢	4.925¢	4.925¢	4.675¢
Cold-rolled sheets	6.05	6.05	6.05	5.75
Galvanized sheets (10 ga.)	6.60	6.60	6.60	6.30
Hot-rolled strip	4.925	4.925	4.925	4.675
Cold-rolled strip	7.17	7.17	7.17	6.870
Plate	5.12	5.12	5.12	4.87
Plates, wrought iron	13.15	13.15	13.15	10.40
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	47.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.30	$10.30	$10.30	$9.95
Tin plates, electro (0.50 lb.)	9.00	9.00	9.00	8.65
Special coated mfg. ternes	9.55	9.55	9.55	9.20
Bars and Shapes: (per pound)				
Merchant bar	5.425¢	5.425¢	5.425¢	5.075¢
Cold finished bars	7.30	7.30	7.30	6.85
Alloy bars	6.475	6.475	6.475	6.125
Structural shapes	5.275	5.275	5.275	5.00
Stainless bars (No. 302)	45.00	45.00	45.00	40¾-43¼
Wrought iron bars	14.45	14.45	14.45	11.50
Wire: (per pound)				
Bright wire	7.65¢	7.65¢	7.65¢	7.20¢
Rails: (per 100 lb.)				
Heavy rails	$5.525	$5.525	$5.525	$5.075
Light rails	6.50	6.50	6.50	6.00
Semifinished Steel: (per net ton)				
Rerolling billets	$77.50	$77.50	$77.50	$74.00
Slabs, rerolling	77.50	77.50	77.50	74.00
Forging billets	96.00	96.00	96.00	91.50
Alloy blooms, billets, slabs	114.00	114.00	114.00	107.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.15¢	6.15¢	6.15¢	5.80¢
Skelp	4.875	4.875	4.875	4.225
Finished Steel Composite: (per pound)				
Base price	5.967¢	5.967¢	5.967¢	5.622¢

	Jan. 7 1958	Dec. 27 1957	Dec. 3 1957	Jan. 8 1957
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.51	$70.51	$70.51	$66.88
Foundry, Valley	66.50	66.50	66.50	63.00
Foundry, Southern Cin'ti	71.65	71.65	71.65	67.17
Foundry, Birmingham	62.50	62.50	62.50	59.00
Foundry, Chicago	66.50	66.50	66.50	63.00
Basic, del'd Philadelphia	70.01	70.01	70.01	66.38
Basic, Valley furnace	66.00	66.00	66.00	62.50
Malleable, Chicago	66.50	66.50	66.50	63.00
Malleable, Valley	66.50	66.50	66.50	63.00
Ferromangance, 74-76 pct Mn, cents per lb‡	12.25	12.25	12.25	12.75
Pig Iron Composite: (per gross ton)				
Pig iron	$66.42	$66.42	$66.42	$62.90
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$32.50	$32.50	$32.50	$62.50
No. 1 steel, Phila. area	35.50	35.50	33.00	60.50
No. 1 steel, Chicago	30.50	30.50	30.50	59.50
No. 1 bundles, Detroit	**21.50**	19.50	21.50	52.50
Low phos., Youngstown	**34.50**	33.50	32.50	66.50
No. 1 mach'y cast, Pittsburgh	*49.50*	50.50	50.50	60.50
No. 1 mach'y cast, Philadel'a	50.50	50.50	50.50	60.50
No. 1 mach'y cast, Chicago	**44.50**	43.50	40.50	56.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	**$33.00**	$32.83	$32.00	$60.83
No. 2 bundles	**24.67**	24.50	24.00	48.50
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$15.38	$15.38	$15.38	$15.50
Foundry coke, prompt	$17.50-$19	$17.50-$19	$17.50-$19	$18-19
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	27.00	27.00	27.00	36.00
Copper, Lake, Conn.	27.00	27.00	27.00	36.00
Tin, Straits, N. Y.	**93.00†**	92.625	90.25	99.50
Zinc, East St. Louis	10.00	10.00	10.00	13.50
Lead, St. Louis	12.80	12.80	12.80	15.80
Aluminum, virgin ingot	28.10	28.10	28.10	27.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	33.00	33.00	33.00	33.00

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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Open-End Export Continued

Bureau of Foreign Commerce sees easing of foreign demand for scrap this year.

Open-end licensing is not expected to have any immediate strengthening effect.

▪ Export of scrap will continue under open-end licensing for the first quarter of 1958.

In announcing the open-end licensing, which means no quantitative limits, the Bureau of Foreign Commerce of the Dept. of Commerce acknowledged that "at present overall supplies of scrap are believed to be adequate to meet U. S. needs as well as the indicated requirements of foreign countries."

The decision represents a minor victory for the scrap industry, but it is unlikely to have any immediate strengthening effect on the current market. Export demand is comparatively as weak as the domestic market, following a record-breaking year in '57.

BFC says: "The foreign demand for heavy melting scrap, the potential shortage of which has been a matter of concern during recent years, will apparently be lower in 1958 than in 1957."

Nationwide, the market appears to be establishing its base. Resistance to lower prices is widespread. In many areas offers at quoted prices are not bringing in significant scrap. Many dealers, hard-pressed for cash, are selling only enough tonnage to keep going.

Industrial bundles went for $1 higher this month. This was interpreted as establishing the floor. Strong upward movement is unlikely. But it's generally believed a major buy would bring higher prices.

The IRON AGE No. 1 Heavy Melting Composite price edged upward slightly to $33 with a slight narrowing of the price spread in Philadelphia.

Pittsburgh—There is more talk of strength among brokers and dealers, but still no heavy buying by local mills. This month's $1 increase in industrial prices has been taken to mean the bottom point has been passed. Low phos is up $1, and sales have ranged higher for small lots. However, scattered purchases of other grades show no general trend.

Chicago—The market continues dull in the post-holiday period. Mill offers to buy steel grades at lower prices met strong resistance, and, in some grades, repeated offers to buy at existing price levels failed to bring in fresh scrap. Yards continue to lay down turnings, electric furnace, and even some steelmaking grades, but the buildup is very slow.

Philadelphia—A foundry buy of heavy breakable cast at $39, or $2 above the market, was the only activity here. Price of machine shop turnings was adjusted upward $2 to keep in line with other turnings grades. The spread in primary steelmaking scrap prices was narrowed $1 to $35-$37.

New York—Brokers have slashed buying prices $2 a ton on steelmaking grades. Dealers believe this is a move to boost profits by forcing dealers to sell when brokers believe yard cash is low.

Detroit—One mill came into the market with a token buy of No. 1 grades at a price several dollars above quoted figures. Other mills have not been heard from. Dealers have indicated they won't sell at $20, but would at somewhat higher.

Cleveland—The market is taking some odd twists these days with dealers unwilling to sell at prevailing prices because collections have dried up and they can't replenish their stocks. Two Valley mills, however, bought specialty industrial low phos at $35 to $36.

St. Louis—Buying of scrap by consumers is light, but most prices are unchanged. The flow of material is slow. Some in the trade believe the low level has been reached.

Birmingham — Most dealers are still holding onto scrap, expecting a price rise, possibly as early as next week. But there is a trickle of sales by dealers needing cash. Foundry and electric furnace markets appear a little firmer, but there have not been sufficient sales to establish a market.

Cincinnati — Prices of most grades are off $1 on the basis of mill offers to buy. But the new prices are not bringing in much scrap as dealers are, for the most part, unwilling to sell at prices offered.

Buffalo — There has been no activity here and prices remain unchanged. Mills are using very little scrap and are not eating into their inventories to any large extent. Except for cast, dealers feel prices may sag even lower.

Boston — The market here is really closing up. There is no demand from either export or domestic markets.

West Coast—As predicted, top steelmaking grades dropped $2 per ton in Los Angeles, San Francisco and Seattle. And the new, lower prices are weak. Not much scrap is reported coming out, but it's still ample for the poor demand.

New PAYLOADER® attachment

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This model HA "PAYLOADER" tractor-shovel has a load-carrying capacity of 1,500 lbs. with the grab, and 2,000 lbs. with regular bucket. Other useful model HA attachments are fork lift, tine bucket, pick-up floor sweeper and castered dump hoppers. Operating features include exclusive one-lever bucket control, two speeds each direction, torque converter and rollback, break-out bucket action.

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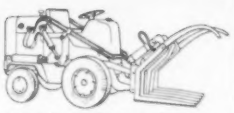
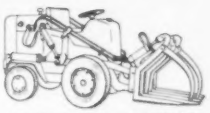


GETS A BIG LOAD



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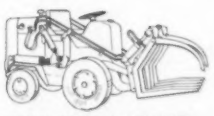

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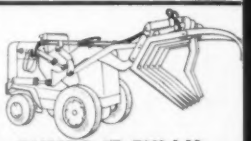

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SCRAP PRICES *(Effective Jan. 7, 1958)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	32.00 to 33.00
No. 1 factory bundles	35.00 to 36.00
No. 2 bundles	28.00 to 29.00
No. 1 busheling	32.00 to 33.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and ms. turn.	16.00 to 17.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Low phos. punch'gs plate	36.00 to 37.00
Heavy turnings	31.00 to 32.00
No. 1 RR hvy. melting	36.00 to 37.00
Scrap rails, random lgth.	47.00 to 48.00
Rails 2 ft and under	55.00 to 56.00
RR steel wheels	45.00 to 46.00
RR spring steel	45.00 to 46.00
RR couplers and knuckles	45.00 to 46.00
No. 1 machinery cast.	49.00 to 50.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	37.00 to 38.00

Chicago

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	30.00 to 31.00
No. 1 factory bundles	35.00 to 36.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	30.00 to 31.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Low phos. forge crops	46.00 to 48.00
Low phos. punch'gs plate	43.00 to 44.00
Low phos. 3 ft and under	42.00 to 43.00
No. 1 RR hvy. melting	35.00 to 36.00
Scrap rails, random lgth.	44.00 to 45.00
Rerolling rails	50.00 to 51.00
Rails 2 ft and under	50.00 to 51.00
Locomotive tires cut	45.00 to 46.00
Cut bolsters & side frames	42.00 to 43.00
Angles and splice bars	47.00 to 48.00
RR steel car axles	50.00 to 51.00
RR couplers and knuckles	44.00 to 45.00
No. 1 machinery cast.	44.00 to 45.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	37.00 to 38.00
Cast iron brake shoe	37.00 to 38.00
Cast iron wheels	37.00 to 39.00
Malleable	50.00 to 51.00
Stove plate	37.00 to 38.00
Steel car wheels	45.00 to 46.00

Philadelphia Area

No. 1 hvy. melting	$35.00 to $37.00
No. 2 hvy. melting	31.00 to 33.00
No. 1 dealer bundles	35.00 to 37.00
No. 2 bundles	25.00 to 27.00
No. 1 busheling	35.00 to 37.00
Machine shop turn.	20.00 to 21.00
Mixed bor. short turn.	21.00 to 22.00
Cast iron borings	22.00 to 23.00
Shoveling turnings	22.00 to 23.00
Clean cast. chem. borings	30.00 to 31.00
Low phos. 5 ft and under	39.00 to 40.00
Low phos. 2 ft and under	40.00 to 41.00
Low phos. punch'gs	40.00 to 41.00
Elec. furnace bundles	36.00 to 37.00
Heavy turnings	30.00 to 31.00
RR steel wheels	45.00 to 46.00
RR spring steel	45.00 to 46.00
Rails 18 in. and under	63.00 to 64.00
Cupola cast.	36.00 to 38.00
Heavy breakable cast.	38.00 to 39.00
Cast iron car wheels	40.00 to 41.00
Malleable	55.00 to 56.00
Unstripped motor blocks	32.00 to 33.00
No. 1 machinery cast.	48.00 to 49.00

Cleveland

No. 1 hvy. melting	$27.00 to $28.00
No. 2 hvy. melting	21.00 to 22.00
No. 1 dealer bundles	27.00 to 28.00
No. 1 factory bundles	31.00 to 32.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	27.00 to 28.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Cut struct'r'l & plates, 2 ft & under	34.00 to 35.00
Drop forge flashings	27.00 to 28.00
Low phos. punch'gs, plate	28.00 to 29.00
Foundry steel, 2 ft & under	33.00 to 34.00
No. 1 RR heavy melting	32.00 to 33.00
Rails 2 ft and under	53.00 to 54.00
Rails 18 in. and under	54.00 to 55.00
Railroad grate bars	14.00 to 15.00
Steel axle turnings	15.00 to 16.00
Railroad cast.	42.00 to 43.00
No. 1 machinery cast.	44.00 to 45.00
Stove plate	40.00 to 41.00
Malleable	54.00 to 55.00

Youngstown

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	31.00 to 32.00
No. 2 bundles	23.00 to 24.00
Machine shop turn.	13.00 to 14.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Low phos. plate	34.00 to 35.00

Buffalo

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	25.50 to 26.50
No. 1 busheling	28.00 to 29.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	22.50 to 23.50
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	14.00 to 15.00
Low phos. plate	34.00 to 35.00
Scrap rails, random lgth.	40.00 to 41.00
Rails 2 ft and under	50.00 to 51.00
RR steel wheels	37.00 to 38.00
RR spring steel	33.00 to 34.00
RR couplers and knucklers	33.00 to 34.00
No. 1 machinery cast.	40.00 to 41.00
No. 1 cupola cast.	35.00 to 36.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$21.00 to $22.00
No. 2 hvy. melting	16.00 to 17.00
No. 1 dealer bundles	21.00 to 22.00
No. 2 bundles	14.00 to 15.00
No. 1 busheling	20.00 to 21.00
Drop forge flashings	18.00 to 19.00
Machine shop turn.	7.00 to 8.00
Mixed bor. and turn.	9.00 to 10.00
Shoveling turnings	9.00 to 10.00
Cast iron borings	9.00 to 10.00
Low phos. punch'gs plate	19.00 to 20.00
No. 1 cupola cast.	27.00 to 28.00
Heavy breakable cast.	22.00 to 23.00
Stove plate	22.00 to 23.00
Automotive cast.	30.00 to 31.00

St. Louis

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	32.00 to 33.00
No. 2 bundles	22.00 to 23.00
Machine shop turn.	14.00 to 15.00
Cast iron borings	16.00 to 17.00
Shoveling turnings	17.00 to 18.00
No. 1 RR hvy. melting	34.00 to 35.00
Rails, random lengths	40.00 to 41.00
Rails, 18 in. and under	46.00 to 47.00
Angles and splice bars	40.00 to 41.00
Std. steel car axles	43.00 to 44.00
RR specialties	42.00 to 43.00
Cupola cast.	42.00 to 43.00
Heavy breakable cast.	32.00 to 33.00
Cast iron brake shoes	37.00 to 38.00
Stove plate	37.00 to 38.00
Cast iron car wheels	32.00 to 33.00
Rerolling rails	46.00 to 47.00
Unstripped motor blocks	32.00 to 33.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$23.00 to $24.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	23.00 to 24.00
No. 2 bundles	14.00 to 15.00
No. 1 busheling	23.00 to 24.00
Elec. furnace, 3 ft & under	29.00 to 30.00
Machine shop turn.	8.50 to 9.50
Mixed bor. and short turn.	9.50 to 10.50
Shoveling turnings	10.00 to 11.00
Clean cast. chem. borings	16.00 to 17.00
No. 1 machinery cast.	32.00 to 33.00
Mixed cupola cast.	27.00 to 28.00
Heavy breakable cast.	25.00 to 26.00
Stove plate	26.00 to 27.00
Unstripped motor blocks	26.00 to 27.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	24.00 to 25.00
No. 2 dealer bundles	17.00 to 18.00
Machine shop turn.	11.00 to 12.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Clean cast. chem. borings	23.00 to 24.00
No. 1 machinery cast.	34.00 to 35.00
Mixed yard cast.	29.00 to 30.00
Charging box cast.	30.00 to 31.00
Heavy breakable cast.	30.00 to 31.00
Unstripped motor blocks	27.00 to 28.00

Birmingham

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	16.00 to 17.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	12.00 to 13.00
Electric furnace bundles	35.00 to 36.00
Elec. furnace, 3 ft & under	33.00 to 34.00
Bar crops and plate	39.00 to 40.00
Structural and plate, 2 ft	39.00 to 40.00
No. 1 RR hvy. melting	34.00 to 35.00
Scrap rails, random lgth.	41.00 to 42.00
Rails, 18 in. and under	48.00 to 49.00
Angles & splice bars	40.00 to 41.00
Rerolling rails	47.00 to 48.00
No. 1 cupola cast.	48.00 to 49.00
Stove plate	47.00 to 48.00
Charging box cast.	22.00 to 23.00
Cast iron car wheels	36.00 to 37.00
Unstripped motor blocks	38.00 to 39.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	23.50 to 24.50
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	22.00 to 23.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	15.00 to 16.00
Low phos., 18 in. and under	37.00 to 38.00
Rails, random length	42.00 to 43.00
Rails, 18 in. and under	53.00 to 54.00
No. 1 cupola cast.	37.00 to 38.00
Hvy. breakable cast.	33.00 to 34.00
Drop broken cast.	47.00 to 48.00

San Francisco

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	32.00
No. 1 dealer bundles	$30.00 to 32.00
No. 2 bundles	24.00
Machine shop turn.	17.00
Cast iron borings	17.00
No. 1 RR hvy. melting	34.00
No. 1 cupola cast.	42.00

Los Angeles

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	32.00
No. 1 dealer bundles	$29.00 to 30.00
No. 2 bundles	22.00 to 24.00
Machine shop turn.	11.00
Shoveling turnings	14.00
Cast iron borings	14.00
Elec. furn. 1 ft and under (foundry)	45.00
No. 1 RR hvy. melting	34.00
No. 1 cupola cast	38.00

Seattle

No. 1 hvy. melting	$30.00 to $32.00
No. 2 hvy. melting	28.00 to 30.00
No. 2 bundles	24.00
No. 1 cupola cast	36.00
Mixed yard cast.	36.00

Hamilton, Ont.

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	27.00
No. 1 dealer bundles	32.00
No. 2 bundles	22.00
Mixed steel scrap	27.00
Busheling	22.00
Bush., new fact. prep'd	32.00
Bush., new fact. unprep'd	26.00
Machine shop turn.	17.00
Short steel turn.	21.00
Mixed bor. and turn.	17.00
Rails, rerolling	41.00
Cast scrap	$44.00 to 47.00

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For over half a century our experience, personnel, equipment and key office locations have contributed to the steady growth of the iron and steel industry. Possibly our facilities may help you solve a problem in iron or steel scrap—no matter how big or small.
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DETROIT (SCRAPSEL), MICHIGAN
PITTSBURGH, PENNA.
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BIRMINGHAM, ALA.
BOSTON, MASS.
BUFFALO, N. Y.
CHICAGO, ILLINOIS
CLEVELAND, OHIO
HOUSTON, TEXAS
LOS ANGELES, CAL.
NEW YORK, N. Y.
PITTSBURGH, PENNA.
READING, PENNA.
ST. LOUIS, MISSOURI
SAN FRANCISCO, CAL.
SEATTLE, WASH.
LIVINGSTON & SOUTHARD, INC.
FORENTA CO.

Prices Are Weak In Sagging Market

There are strong pressures for drop in lead, zinc and copper prices.

Buyers apparently are uninterested, even at lower prices.

Sellers are trying to hold the line until the business climate is better defined.

▪ Three nonferrous metals—lead, zinc, and producers copper—are teetering on the edge of a price cut. There are definite pressures in this direction.

The big question is whether offsetting factors are strong enough to hold current prices until business conditions for the first quarter are better defined.

LME Pressure — The depressed condition of the London Metals Exchange is one of the major discouraging factors. Prices for copper, lead, and zinc at London are flirting with a level at which metal can be bought, shipped to the U. S. insured, duty and handling paid, and sold for a profit at slightly less than the U. S. price.

This is not being done, to any great extent, because of the apparent lack of buyer interest even at lower prices. This disinterest is discouraging some U. S. sellers from lowering their prices. But, by itself it can not hold these metals up for long. Some large smelters pay for ore and concentrates on a formula pegged on the U. S. price for the metal.

Expect Tariff Action—Zinc and lead sellers appear to be trying to hold the price line until the U. S. Tariff Commission makes its recommendation to the President. The industry feels it will be soon. They expect a slightly higher tariff to lend some support to the market.

The copper market is in perhaps the worst shape in its relationship to the LME price. The London price, plus all expenses to move the metal to New York, is a full cent under custom smelters' quotation and over 2¢ less than producers.

No Chilean Cutback — Also, it now appears that Chile will not cut back production. An informed source says Chilean copper costs only 9¢ to 11¢ to mine and refine. Even at today's low price there is plenty of profit. Chile avidly seeks the highest market for her metals, without showing any favoritism.

Nickel

Dr. John F. Thompson, chairman of International Nickel, paints a bright picture for nickel users.

"Barring any presently unforeseen large increases in defense demands, it is expected that there will be more nickel available to the industries of the free world in the coming year than was the case in 1957."

"In view of the announcement of the United States Government that it desires to divert to industry all nickel scheduled for stockpiling, it is expected that the supply in that country will exceed demand."

Here's the way the Inco head says nickel supply stacked up in 1957:

Free World supply—490 million lb*
Delivery by Canadian producers—360 million lb*
Inco delivery—291 million lb**

*** New record **Possible new high**

Aluminum

Kaiser Aluminum & Chemical Corp. is now selling alloy pig in two smaller sizes. Available in 10 and 30 lb pigs are alloys 2312, A2312, 2393 and 2364. The standdard 50 lb pig of these alloys is still available.

The Aluminum Assn. reports shipments of sheet and plate were off in November.

	November (net lbs)	October
non-heat-treatable	68,096,000	86,991,000
heat-treatable	12,993,000	18,263,000
total	81,089,999	105,254,000

Tin prices for the week: Dec. 26—92.75; Dec. 27—92.625; Dec. 30—92.375; Dec. 31—91.75; Jan. 2—92.125; Jan. 3—92.875; Jan. 6—93.00; Jan. 7—93.00.*

*Estimate.

Monthly Average Metal Prices

(Cents per lb except as noted)

Average prices of the major nonferrous metals in December based on quotations appearing in THE IRON AGE, were as follows:

Electrolytic copper, del'd Conn. Valley	27.00
Copper, Lake	27.00
Straits Tin, New York	92.375
Zinc, E. St. Louis	10.00
Lead, St. Louis	12.80
Aluminum ingot	28.10

Note: Quotations are going prices

Primary Prices

(cents per lb)	Current price	last price	date of change
Aluminum pig	26.00	25.00	8/1/57
Aluminum ingot	28.10	27.10	8/1/57
Copper (E)	27.00	28.50	9/3/57
Copper (CS)	25.50	25.00	12/16/57
Copper (L)	27.00	28.50	9/3/57
Lead, St. L.	12.80	13.30	12/2/57
Lead, N. Y.	13.00	13.50	12/2/57
Magnesium ingot	38.00	34.00	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	74.00	64.50	12/6/56
Titanium sponge	185-250	185-225	5/5/57
Zinc, E. St. L.	10.00	10.50	7/1/57
Zinc, N. Y.	10.50	11.00	7/1/57

ALUMINUM: 99% ingot frt allwd. **COPPER:** (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. **LEAD:** common grade. **MAGNESIUM:** 99.8% pig, Velasco, Tex. **NICKEL:** Port Colbourne, Canada. **ZINC:** prime western. **TIN:** see above; other primary prices, pg. 108.

Choose the combination that's just right for you

. . . in a Bristol Brass Alloy for your Product

A *harmonious* combination . . . one that's exactly suited to your manufacturing, marketing, and even your *color* requirements . . . that's what you get in Bristol Brass. For here, past masters of the art of Brass blending never stop trying to adjust the original specifications of every customer's alloy more closely to its use. Net result — you get a Brass that bears your own special trademark, *but at the standard price.*

And speaking of price, it's been years since the unmatched advantages of Brass could be bought at such attractive levels as today's. *So get on the solid Brass standard.* Let us show you what Bristol Brass strip, rod and wire can do to give *your* product a lift, both in manufacturing and sales. Call Ludlow 2-3161, and ask for a sales engineer.

The **BRISTOL BRASS**
CORPORATION

Since 1850, makers of Brass strip, rod and wire in Bristol, Conn. (Now also the home of ACCURATE BRASS CORP. (Subsidiary), producers of Fine Forgings.)

Bristol Brass has offices and warehouses in Boston, Buffalo, Chicago, Cleveland, Dayton, Detroit, Milwaukee, New York, Philadelphia, Pittsburgh, Rochester, Syracuse.

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate
("F" temper except 6061-0)

Alloy	.032	.081	.136-.249	.250-3
1100, 3003	46.6	44.3	43.6	42.7
5052	54.0	48.9	47.2	45.4
6061-0	51.4	47.0	45.2	45.1

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8	45.0-46.8	60.4-64.1
12-14	45.7-47.2	61.3-65.8
24-26	49.0-49.5	72.1-76.8
36-38	58.0-58.6	96.2-99.8

Screw Machine Stock—2011-T-3

Size*	¼	⅜-⅝	¾-1	1¼-1½
Price	63.0	62.5	61.0	58.6

Roofing Sheet, Corrugated
(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.420	$1.893	$2.367	$2.839
.024 gage	1.774	2.366	2.957	3.549

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250-3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	108.1
AZ31B Spec.	.....	93.3	95.7	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Red	Tube
Copper	50.13	.....	47.36	50.32
Brass, 70/30	44.02	44.56	45.26	46.93
Brass, Low	45.50	47.04	46.44	49.31
Brass, R L	47.37	47.91	47.31	50.18
Brass, Naval	48.27	.....	42.58	51.68
Munts Metal	46.39	.....	42.23	.....
Comm. Bs.	48.78	49.32	48.72	51.34
Mang. Bs.	52.01	.....	46.11	.....
Phos. Bs. 5%	69.07	.....	69.57	.....

Free Cutting Brass Rod 32.30

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $9.50-$10.60; alloy, $14.75; Plate, HR, commercially pure, $8.00-$8.75; alloy, $10.75. Wire, rolled and/or drawn, commercially pure, $7.50-$8.00; alloy, $10.00; Bar, HR or forged, commercially pure, $6.15-$6.40; alloy, $6.15-$6.35; billets, HR, commercially pure, $6.00-$6.25; alloy, $6.00-$6.20.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 33.50
Beryllium aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.55
Calcium, 99.8%, small lots ..... $ 4.55
Chromium, 99.8% metallic basis .. $ 1.31
Cobalt, 97-99% (per lb) ... $2.00 to $2.07
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 39.50 to 53.50
Gold, U. S. Treas, per troy oz. $35.00
Indium, 99.9%, dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz.... $80 to $90
Lithium, 98% ..... $11.00 to $14.00
Magnesium, sticks, 100 to 500 lb.... 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York ..... $225 to $230
Nickel oxide sinter at Copper Cliff, Ont., contained nickel 71.25
Palladium, dollars per troy oz... $23 to $24
Platinum, dollars per troy oz... $77 to $80
Rhodium ..... $120.00 to $125.00
Silver ingots (¢ per troy oz.) 89.875
Thorium, per kg. $43.00
Vanadium ..... $ 3.45
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 27.25
No. 120 ..... 26.25
No. 123 ..... 25.50
80-10-10 ingot
No. 395 ..... 31.25
No. 315 ..... 29.25
88-10-2 ingot
No. 210 ..... 38.25
No. 215 ..... 34.00
No. 245 ..... 30.75
Yellow ingot
No. 405 ..... 22.75
Manganese bronze
No. 421 ..... 24.50

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 25.75-26.50
0.60 copper max. 25.50-26.25
Piston alloys (No. 122 type) .. 24.25-25.00
No. 12 alum. (No. 2 grade) ... 22.00-23.00
108 alloy 22.25-23.50
195 alloy 25.25-26.75
13 alloy (0.60 copper max.) .. 25.50-26.25
AXS-679 ..... 22.25-23.50

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½% 23.00-24.00
Grade 2—92-95% 21.75-22.50
Grade 3—90-92% 20.50-21.50
Grade 4—85-90% 18.25-19.25

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	23	22¼
Yellow brass	17⅜	15¾
Red brass	20¼	19½
Comm. bronze	21	20¼
Mang. bronze	16⅛	15⅜
Yellow brass rod ends	17⅛	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 20½
No. 2 copper wire 19
Light copper 16¾
*Refinery brass 18½
Copper bearing material 18
*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 20½
No. 2 copper wire 19
Light copper 16¾
No. 1 composition 19
No. 1 comp. turnings 18½
Hvy. yellow brass solids 13
Brass pipe 15¼
Radiators 15

Aluminum

Mixed old. cast. ..... 13½—14
Mixed new clips ..... 16 —16½
Mixed turnings, dry ..... 14 —15

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 18¼—18¾
No. 2 copper wire ..... 16¼—16¾
Light copper ..... 14¾—15¼
Auto radiators (unsweated) .. 11¾—12
No. 1 composition ..... 15½—16
No. 1 composition turnings... 15 —15½
Cocks and faucets ..... 12 —12½
Clean heavy yellow brass ... 11 —11½
Brass pipe ..... 12½—13
New soft brass clippings .... 13 —13½
No. 1 brass rod turnings .... 11¼—11¾

Aluminum

Alum. pistons and struts .... 5½— 6
Aluminum crankcases ..... 10½—11
1100 (2S) aluminum clippings 14 —14½
Old sheet and utensils ..... 10½—11
Borings and turnings ..... 6½— 7
Industrial castings ..... 10½—11
2024 (24S) clippings ..... 12 —12½

Zinc

New zinc clippings ..... 4 — 4½
Old zinc ..... 3 — 3¼
Zinc routings ..... 1¾— 2
Old die cast scrap ..... 1½— 1¾

Nickel and Monel

Pure nickel clippings 42-45
Clean nickel turnings 37-40
Nickel anodes 42-45
Nickel rod ends 42-45
New Monel clippings 28-29
Clean Monel turnings 26-23
Old sheet Monel 25-26
Nickel silver clippings, mixed. 18
Nickel silver turnings, mixed. 15

Lead

Soft scrap lead ..... 8½— 9
Battery plates (dry) ..... 3½— 3¾
Batteries, acid free ..... 2½— 2¾

Miscellaneous

Block tin ..... 75 —76
No. 1 pewter ..... 59 —60
Auto babbitt ..... 39 —40
Mixed common babbitt ..... 11 —11½
Solder joints ..... 14½—15
Siphon tops 42
Small foundry type ..... 12 —12¼
Monotype ..... 12 —12¼
Lino. and stereotype ..... 11 —11¼
Electrotype ..... 10 —10¼
Hand picked type shells ..... 7 — 7½
Lino. and stereo. dross ..... 3 — 3¼
Electro dross ..... 2½— 2¾

(Effective Jan. 6, 1958)

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$114.00 *B3*		5.325 *B3*	7.80 *B3*	5.325 *B3*						
	Buffalo, N. Y.	$77.50 *R3, B3*	$96.00 *R3, B3*	$114.00 *R3, B3*	6.225 *B3*	5.325 *B3*	7.80 *B3*	5.325 *B3*	4.925 *R3, B3*	7.15 *S10*	7.325 *B3*			
	Phila., Pa.									7.70 *P15*				
	Harrison, N. J.													15.05 *C11*
	Conshohocken, Pa.		$101.00 *A2*	$121.00 *A2*					4.975 *A2*	7.20 *A2*	7.325 *A2*			
	New Bedford, Mass.									7.60 *R6*				
	Johnstown, Pa.	$77.50 *B3*	$96.00 *B3*	$114.00 *B3*		5.325 *B3*	7.80 *B3*							
	Boston, Mass.									7.70 *T8*				15.40 *T8*
	New Haven, Conn.									7.60 *D1*				
	Baltimore, Md.									7.15 *T8*				
	Phoenixville, Pa.					5.325 *P2*		5.325 *P2*						
	Sparrows Pt., Md.								4.925 *B3*		7.325 *B3*			
	Bridgeport, Wallingford, Conn.			$114.00 *N8*						7.60 *W1*				
	Pawtucket, R. I. Worcester, Mass.									7.70 *N7* 7.70 *A5*				15.40 *N7* 15.20 *T8*
MIDDLE WEST	Alton, Ill.								5.125 *L1*					
	Ashland, Ky.								4.925 *A7*					
	Canton-Massillon, Dover, Ohio		$96.00 *R3*	$114.00 *R3, T5*						7.15 *G4*		10.45 *G4*		14.85 *C11*
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	$77.50 *U1, R3*	$96.00 *U1, R3,W8*	$114.00 *U1, R3,W8*	6.225 *U1*	5.275 *U1, W8 P13*	7.75 *U1,Y1 W8*	5.275 *U1*	4.925 *W8, N4,A1*	7.25 *A1,T8 M8*			8.10 *W8, S9,I3*	15.05 *A1, S9,G4*
	Cleveland, Ohio									7.15 *A5,J3*		10.45 *A5*	8.10 *J3*	
	Detroit, Mich.			$114.00 *R3*					5.025 *G3, M2*	7.25 *M2,D1, D2,G3,P11*	7.425 *G3*	10.60 *D2* 10.55 *G3*	8.10 *G3*	
	Anderson, Ind.									7.15 *G4*				
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$77.50 *U1*	$96.00 *U1*	$114.00 *U1, Y1*		5.275 *U1, I3*	7.75 *U1, I3*	5.275 *I3*	4.925 *U1, I3,Y1*	7.15 *Y1*	7.325 *U1, I3,Y1*	10.60 *Y1*	8.10 *U1, Y1*	
	Sterling, Ill.	$77.50 *N4*				5.275 *N4*			5.025 *N4*					
	Indianapolis, Ind.									7.30 *J3*				15.20 *J3*
	Newport, Ky.												8.10 *A9*	
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.		$96.00 *S1, C10*	$114.00 *C10,S1*					4.925 *R3, S1*	7.15 *R3,T4 S1*	7.325 *R3, S1*	10.50 *S1* 10.45 *R3*	8.10 *S1*	15.05 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Aliquippa, Pa.	$77.50 *U1, P6*	$96.00 *U1, C11,P6*	$114.00 *U1, C11,B7*	6.225 *U1*	5.275 *U1, J3*	7.75 *U1, J3*	5.275 *U1*	4.925 *P6*	7.15 *J3,B4, S7*			8.10 *S9*	15.05 *S9*
	Weirton, Wheeling, Follansbee, W. Va.				6.225 *W3*	5.275 *W3*			4.925 *W3*	7.15 *W3,F3*	7.325 *W3*	10.50 *W3*		
	Youngstown, Ohio	$77.50 *R3*	$96.00 *Y1, C10*	$114.00 *Y1*			7.75 *Y1*			7.15 *Y1,J3*	7.325 *U1, Y1*	10.65 *Y1*	8.10 *U1, Y1*	15.05 *J3* 10.65 *Y1*
WEST	Fontana, Cal.	$88.00 *K1*	$105.50 *K1*	$135.00 *K1*		6.075 *K1*	8.55 *K1*	6.225 *K1*	5.675 *K1*	9.00 *K1*				
	Geneva Utah		$96.00 *C7*			5.275 *C7*	7.75 *C7*							
	Kansas City, Mo.					5.375 *S2*	7.85 *S2*						8.35 *S2*	
	Los Angeles, Torrance, Cal.		$105.50 *B2*	$134.00 *B2*		5.975 *C7, B2*	8.45 *B2*		5.675 *C7, B2*	9.05 *J3*			9.30 *B2*	17.25 *J3*
	Minnequa, Colo.					5.575 *C6*			6.025 *C6*	9.10 *K1*				
	Portland, Ore.					6.025 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$105.50 *B2*			5.925 *B2*	8.40 *B2*		5.675 *C7, B2*					
	Seattle, Wash.		$109.50 *B2*			6.025 *B2*	8.50 *B2*		5.925 *B2*					
SOUTH	Atlanta, Ga.					5.475 *A8*			5.125 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$77.50 *T2*	$96.00 *T2*			5.275 *T2, R3,C16*	7.75 *T2*		4.925 *T2, R3,C16*		7.325 *T2*			
	Houston, Lone Star, Texas		$101.00 *S2*	$119.00 *S2*		5.375 *S2*	7.85 *S2*						8.35 *S2*	

(Effective Jan. 6, 1958)

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		BLACK PLATE
		Hot rolled *18* ga. & hvyr.	Cold-rolled	Galvanized	Enamel-ing	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* *1.25*-lb. base box	Electro* *0.25*-lb. base box	Holloware Enameling *29* ga.
EAST	Bethlehem, Pa.												
	Buffalo, N. Y.	4.925 *B3*	6.05 *B3*				7.275 *B3*	8.975 *B3*		6.15 *W6*			
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	4.975 *A2*	6.10 *A2*				7.325 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.15 *B3*			
	Fairless, Pa.	4.975 *U1*	6.10 *U1*				7.325 *U1*	9.025 *U1*			$10.15 *U1*	$8.85 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	4.925 *B3*	6.05 *B3*	6.60 *B3*			7.275 *B3*	8.975 *B3*	9.725 *B3*	6.25 *B3*	$10.15 *B3*	$8.85 *B3*	
	Worcester, Mass.									6.45 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.35 *L1*			
	Ashland, Ky	4.925 *A7*		6.60 *A7*	6.625 *A7*								
	Canton-Massillon, Dover, Ohio			6.60 *R3, R1*									
	Chicago, Joliet, Ill.	4.925 *W8, A1*					7.275 *U1*			6.15 *A5, R3, W8, N4, K2*			
	Sterling, Ill.									6.25 *N4, K2*			
	Cleveland, Ohio	4.925 *R3, J3*	6.05 *R3, J3*		6.625 *R3*		7.275 *R3, J3*	8.975 *R3, J3*		6.15 *A5*			
	Detroit, Mich.	5.025 *G3, M2*	6.15 *G3* 6.05 *M2*				7.375 *G3*	9.075 *G3*					
	Newport, Ky	4.925 *A1*	6.05 *A1*										
	Gary, Ind. Harbor, Indiana	4.925 *U1, I3, Y1*	6.05 *U1, I3, Y1*	6.60 *U1, I3*	6.625 *U1, I3, Y1*	7.00 *U1*	7.275 *U1, Y1, I3*	8.975 *U1, Y1*		6.15 *Y1*	$10.05 *U1, Y1*	$8.75 *I3, U1, Y1*	7.50 *U1, Y1*
	Granite City, Ill.	5.125 *G2*	6.25 *G2*	6.80 *G2*	6.825 *G2*							$8.85 *G2*	7.60 *G2*
	Kokomo, Ind.			6.70 *C9*						6.25 *C9*			
	Mansfield, Ohio		6.05 *E2*			7.00 *E2*							
	Middletown, Ohio		6.05 *A7*	6.60 *A7*	6.625 *A7*	7.00 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	4.925 *R3, N3, S1*	6.05 *R3*	6.60 *R3*	6.625 *N3, S1*	7.00 *N3, S1, R3*	7.275 *R3*	8.975 *S1, R3*				$8.75 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Donora, Pa. Aliquippa, Pa.	4.925 *U1, J3, P6*	6.05 *U1, J3, P6*	6.60 *U1, J3*	6.625 *U1*		7.275 *U1, J3*	8.975 *U1, J3*	9.725 *U1*	6.15 *A5, J3, P6*	$10.05 *U1, J3*	$8.75 *U1, J3*	7.50 *U1, J3*
	Portsmouth, Ohio	4.925 *P7*	6.05 *P7*							6.15 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.925 *W3, W5*	6.05 *W3, F3, W5*	6.60 *W3, W5*		7.00 *W3, W5*	7.275 *W3*	8.975 *W3*			$10.05 *W5, W3*	$8.75 *W5, W3*	7.50 *W5*
	Youngstown, Ohio	4.925 *U1, Y1*	6.05 *Y1*		6.625 *Y1*		7.275 *Y1*	8.975 *Y1*		6.15 *Y1*			
WEST	Fontana Cal.	5.675 *K1*	7.30 *K1*				8.025 *K1*	10.275 *K1*			$10.80 *K1*	$9.50 *K1*	
	Geneva, Utah	5.025 *C7*											
	Kansas City, Mo.									6.40 *S2*			
	Los Angeles, Torrance, Cal.									6.95 *B2*			
	Minnequa, Colo.									6.40 *C6*			
	San Francisco, Niles, Pittsburgh, Cal.	5.625 *C7*	7.00 *C7*	7.35 *C7*						6.95 *C7*	$10.80 *C7*	$9.50 *C7*	
	Seattle, Wash.												
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	4.925 *T2, R3*	6.05 *T2, R3*	6.60 *T2, R3*						6.15 *T2, R3*	$10.15 *T2*	$8.85 *T2*	
	Houston, Tex.									6.40 *S2*			

† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box.

* COKES: 1.50-lb. add 25¢.

ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb. 0.25 lb. add 65¢.

(Effective Jan. 6, 1958)

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforc-ing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfrs'. Bright
EAST	Bethlehem, Pa.				6.475 *B3*	8.775 *B3*	7.925 *B3*					
	Buffalo, N. Y.	5.425 *R3,B3*	5.425 *R3,B3*	7.35 *B5*	6.475 *B3,R3*	8.775 *B3,B5*	7.925 *B3*	5.10 *B3*		7.20 *B3*		7.65 *W6*
	Claymont, Del.							5.10 *C4*		7.20 *C4*	7.625 *C4*	
	Coatesville, Pa.							5.10 *L4*		7.20 *L4*	7.925 *L4*	
	Conshohocken, Pa.							5.20 *A2*	6.175 *A2*	7.20 *A2*	7.625 *A2*	
	Harrisburg, Pa.							5.10 *P2*	6.275 *P2*			
	Milton, Pa.	5.575 *M7*	5.575 *M7*									
	Hartford, Conn.			7.80 *R3*		9.075 *R3*	7.925 *B3*					
	Johnstown, Pa.	5.425 *B3*	5.425 *B3*		6.475 *B3*			5.10 *B3*		7.20 *B3*	7.625 *B3*	7.65 *B3*
	Fairless, Pa.	5.575 *U1*	5.575 *U1*		6.625 *U1*							
	Newark, N. J. Camden, N. J.			7.75 *W10* 7.75 *P10*		8.95 *W10* 8.95 *P10*						
	Bridgeport, Conn. Putnam, Conn. Willimantic, Conn.			7.85 *W10* 7.80 *J3*	6.55 *N8*	8.925 *N8*						
	Sparrows Pt., Md.		5.425 *B3*					5.10 *B3*		7.20 *B3*	7.625 *B3*	7.75 *B3*
	Palmer, Worcester, Readville, Mass. Mansfield, Mass.			7.85 *B5,C14*		9.075 *A5,B5*						7.95 *A5, W6*
	Spring City, Pa.			7.75 *K4*		8.95 *K4*						
MIDDLE WEST	Alton, Ill.	5.625 *L1*										7.85 *L1*
	Ashland,Newport,Ky.							5.10 *A7,A1*		7.20 *A1*		
	Canton, Massillon, Ohio			7.30 *R3,R2*	6.475 *R3,T5*	8.775 *R3,R2, T5*						
	Chicago, Joliet, Waukegan, Ill. Harvey, Ill.	5.425 *U1,R3, W8,N4,P13*	5.425 *U1,R3, N4,P13*	7.30 *A5, W10,W8 B5,L2,N9*	6.475 *U1,R3, W8*	8.775 *A5, W10,W8 L2,N8,B5*	7.925 *U1,W8*	5.10 *U1,A1, W8,I3*	6.175 *U1*	7.20 *U1,W8*	7.625 *U1,W8*	7.65 *A5,R3, W8,N4, K2,W7*
	Cleveland, Ohio Elyria, Ohio	5.425 *R3*	5.425 *R3*	7.30 *A5,C13 C18*		8.775 *A5, C13, C18*	7.925 *R3*	5.20 *R3,J3*	6.175 *J3*		7.625 *R3, J3*	7.65 *A5, C13*
	Detroit, Mich.	5.525 *G3*	5.775 *G3*	7.55 *P3* 7.50 *P8,B5*	6.475 *R5* 6.575 *G3*	8.775 *R5* 8.975 *B5,P3, P8*	8.025 *G3*	5.20 *G3*		7.35 *G3*		
	Duluth, Minn.											7.65 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.425 *U1,I3, Y1*	5.425 *U1,I3, Y1*	7.30 *R3,J3*	6.475 *U1,I3, Y1*	8.775 *R3,M4*	7.925 *U1, Y1*	5.10 *U1,I3, Y1*	6.175 *J3,I3*	7.20 *U1,Y1*	7.625 *U1, Y1,I3*	7.75 *M4*
	Granite City, Ill.							5.30 *G2*				
	Kokomo, Ind.											7.75 *C9*
	Sterling, Ill.	5.525 *N4*	5.525 *N4*					5.10 *N4*				7.75 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.30 *C10*	6.475 *C10,S1*	8.775 *C10*	7.925 *S1*	5.10 *R3,S1*		7.20 *S1*	7.625 *R5, S1*	
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.425 *U1,J3*	5.425 *U1,J3*	7.30 *A5,B4, R3,J3,C11, W10,S9,C8*	6.475 *U1,J3, C11,B7*	8.775 *A5, W10,R3,S9, C11,C8*	7.925 *U1,J3*	5.10 *U1,J3*	6.175 *U1*	7.20 *U1,J3, B7*	7.625 *U1,J3, B7*	7.65 *A5, J3,P6*
	Portsmouth, Ohio											7.65 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.10 *W5*				
	Youngstown, Ohio	5.425 *U1,R3, Y1*	5.425 *U1,R3, Y1*	7.30 *A5,Y1, F2*	6.475 *U1,Y1*	8.775 *Y1,F2*	7.925 *U1,Y1*	5.10 *U1,R3, Y1*		7.20 *Y1*	7.625 *U1, R3,Y1*	7.65 *Y1*
WEST	Emeryville, Cal. Fontana, Cal.	6.175 *J5* 6.125 *K1*	6.175 *J5* 6.125 *K1*		7.525 *K1*		8.625 *K1*	5.90 *K1*		8.00 *K1*	8.425 *K1*	
	Geneva, Utah							5.10 *C7*			7.625 *C7*	
	Kansas City, Mo.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*					7.90 *S2*
	Los Angeles, Torrance, Cal.	6.125 *C7,B2*	6.125 *C7,B2*	8.75 *R3,P14*	7.525 *B2*	10.65 *P14*	8.625 *B2*					8.60 *B2*
	Minnequa, Colo.	5.875 *C6*	5.875 *C6*					5.95 *C6*				7.90 *C6*
	Portland, Ore.	6.175 *O2*	6.175 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.125 *C7* 6.175 *B2*	6.125 *C7* 6.175 *B2*				8.675 *B2*					8.60 *C7,C6*
	Seattle Wash.	6.175 *B2,N6*	6.175 *B2*				8.675 *B2*	6.00 *B2*		8.10 *B2*	8.525 *B2*	
SOUTH	Atlanta, Ga.	5.625 *A8*	5.625 *A8*									7.85 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.425 *T2,R3, C16*	5.425 *T2,R3, C16,S11*	7.90 *C16*			7.925 *T2*	5.10 *T2,R3*			7.625 *T2*	7.65 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*	5.20 *S2* 5.45 *L3*		7.30 *S2*	7.725 *S2*	7.90 *S2*

(Effective Jan. 6, 1958)

† Merchant Quality—Special Quality 35¢ higher.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 J. & L. Steel Co., Stainless Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING — Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Youngstown *R3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fontana *K1*	+8.25	+23.5	+5.25	+19.5	+1.75	+15.00	0.75	+14.25	1.25	+13.25	1.75	+12.75	3.25	+13.00								
Pittsburgh *J3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Alton, Ill. *L1*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Sharon *M3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fairless *N2*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Pittsburgh *N1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Wheeling *W5*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Wheatland *W4*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Youngstown *Y1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Indiana Harbor *Y1*	4.25	+11.0	7.25	+7.0	10.75	+2.50	13.25	+1.75	13.25	+0.75	14.25	+0.25	15.75	+1.00								
Lorain *N2*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Youngstown *R3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Fairless *N2*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Fontana *K1*	+3.75		0.25		3.25		3.75		4.25		4.75		5.25									
Pittsburgh *J3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Alton, Ill. *L1*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Sharon *M3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Pittsburgh *N1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Wheeling *W5*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Wheatland *W4*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Youngstown *Y1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Indiana Harbor *Y1*	8.75	+5.0	12.75	+1.0	15.75	3.50	16.25	2.25	16.75	3.25	17.25	3.75	17.75	2.50								
Lorain *N2*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50

Threads only, buttweld and seamless 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower d'acounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 10¢ per lb.

(Effective Jan. 6, 1958)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.795	T-1
18	4	1	—	5	2.50	T-4
18	4	2	—	—	1.96	T-2
1.5	4	1.5	8	—	1.155	M-1
6	4	3	6	—	1.545	M-3
6	4	2	5	—	1.30	M-2
High-carbon chromium					.925	D-3, D-5
Oil hardened manganese					.475	O-2
Special carbon					.36	W-1
Extra carbon					.36	W-1
Regular carbon					.305	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

		Plate (*A3, J2, L4, C4*)			Sheet (*I2*)
	Cladding	10 pct	15 pct	20 pct	20 pct
Stainless Type	302				37.50
	304	37.95	42.25	46.70	40.00
	316	44.40	49.50	54.50	58.75
	321	40.05	44.60	49.30	47.25
	347	42.40	47.55	52.80	57.00
	405	29.85	33.35	36.85	.....
	410	29.55	33.10	36.70	.....
	430	29.80	33.55	37.25	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 40.25; 1 side, 33.95.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.525	6.50	6.975	.....	.....	.....	14.75
Cleveland *R3*	.....	.....	.....	9.75	.....	.....	.....
So. Chicago *R3*	.....	.....	.....	.....	.....	.....	.....
Ensley *T2*	5.525	6.50	.....	9.75	.....	6.60	.....
Fairfield *T2*	.....	6.50	.....	.....	.....	.....	.....
Gary *U1*	5.525	.....	.....	.....	.....	6.60	.....
Huntington *C16*	.....	6.50	.....	.....	.....	.....	.....
Ind. Harbor *I3*	5.525	.....	6.975	9.75	.....	6.60	.....
Ind. Harbor *Y1*	.....	.....	.....	9.75	.....	.....	.....
Johnstown *B3*	.....	6.50	.....	.....	.....	.....	.....
Joliet *U1*	.....	.....	6.975	.....	.....	.....	.....
Kansas City *S2*	.....	.....	.....	9.75	.....	.....	14.75
Lackawanna *B1*	5.525	6.50	6.975	.....	.....	6.60	.....
Lebanon *B1*	.....	.....	6.975	.....	14.50	.....	14.75
Minnequa *C6*	5.525	7.00	6.975	9.75	.....	6.60	14.75
Pittsburgh *P5*	.....	.....	.....	.....	.....	.....	14.75
Pittsburgh *J3*	.....	.....	.....	9.75	.....	.....	.....
Seattle *B2*	.....	.....	.....	10.25	.....	6.75	15.75
Steelton *B1*	5.525	.....	6.975	.....	.....	6.60	.....
Struthers *Y1*	.....	.....	.....	9.75	.....	.....	.....
Torrance *C7*	.....	.....	.....	.....	.....	6.75	.....
Williamsport *S5*	.....	6.50	.....	.....	.....	.....	.....
Youngstown *R3*	.....	.....	.....	9.75	.....	.....	.....

COKE

	Net-Ton
Furnace, beehive (f.o.b.) Connellsville, Pa.	$15.00 to $15.75
Foundry, beehive (f.o.b.)	$17.50 to $19.00
Foundry oven coke	
Buffalo, del'd	$31.75
Detroit, f.o.b.	30.50
New England, del'd	31.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Pa., f.o.b.	29.50
Painesville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville, Is., Pa.	29.25

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1957 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	.....	9.625	.....
Armature	11.10	10.85	11.35
Elect.	11.80	11.55	12.05
Special Motor	.....	12.10	.....
Motor	12.90	12.65	13.15
Dynamo	13.95	13.70	14.20
Trans. 72	15.00	14.75	15.25
Trans. 65	15.55	Grain Oriented	
Trans. 58	16.05	Trans. 66	20.20
Trans. 52	17.10	Trans. 80	19.20
		Trans. 73	19.70

Producing points: Beech Bottom (*W5*); Brackenridge (*A5*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb f.o.b. plant, threaded, with nipples, unbored.

GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	26.00	40	100, 110	10.70
20	72	25.25	35	110	10.70
18	72	25.75	30	110	10.85
14	72	25.75	24	72 to 84	11.25
12	72	26.25	20	90	11.00
10	60	28.00	17	72	11.40
10	48	28.50	14	72	11.85
7	60	28.25	12	60	12.95
6	60	31.50	10	60	13.00
4	40	35.00	8	60	13.30
3	40	37.00			
2½	30	39.25			
2	24	60.75			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$135.00
No. 1 Ohio	120.00
Sec. Quality, Pa., Md., Ky., Mo., Ill.	120.00
No. 2 Ohio	103.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00)	21.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$150.00
Childs, Hays, Pa.	155.00
Chicago District	160.00
Western Utah	175.00
California	180.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren O., Morrisville	157.00-160.00
Silica cement, net ton, bulk, Latrobe	28.50
Silica cement, net ton, bulk, Chicago	25.50
Silica cement, net ton, bulk, Ensley, Ala.	26.50
Silica cement, net ton, bulk, Mt. Union	24.50
Silica cement, net ton, bulk, Utah and Calif.	37.00

Chrome Brick *Per net ton*

Standard chemically bonded, Balt.	$105.00
Standard chemically bonded, Curtiner, Calif.	115.00
Burned, Balt.	99.00

Magnesite Brick

Standard Baltimore	$131.00
Chemically bonded, Baltimore	116.00

Grain Magnesite St. ⅜ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk.	$73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite *Per net ton*

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$16.75
Midwest	17.00
Missouri Valley	15.00

(Effective Jan. 6, 1958)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Annl'd ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	..	212	193	8.65	9.20
Aliquippa *J3***	173	190	..	..	190	8.65	9.325
Atlanta *A8***	175	192	..	214	198	8.75	9.425
Bartonville *K2***	175	192	178	214	198	8.75	9.425**
Buffalo *W6*	.....	.....	.....	.....	.....	8.65	8.95*
Chicago *N4****	173	190	172	212	196	8.65	9.325
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	8.65	.....
Crawf'dav. *M4***	175	192	..	214	198	8.75	9.425
Donora, Pa. *A5*	173	187	..	212	193	8.65	9.20
Duluth *A5*	173	187	..	212	193	8.65	9.20
Fairfield, Ala. *T2*	173	187	..	212	193	8.65	9.20
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2*	178	192	..	217	198	8.90	9.45
Jacksonville *M4*	184-1	197	..	219	203	9.00	9.675
Johnstown *B3***	173	190	172	..	196**	8.65	9.325**
Joliet, Ill. *A5*	173	187	..	212	193	8.65	9.20
Kokomo *C9**	175	189	..	214	195*	8.75	9.30*
L. Angeles *B2*****	.....	.....	.....	.....	.....	9.60	10.275
Kansas City *S2**	178	192	..	217	198*	8.90	9.45*
Minnequa *C6†*	178	192	177	217	198†	8.90	9.45†
Monessen *P6*	.....	.....	.....	.....	193	8.65	9.20
Palmer, Mass. *W6*	.....	.....	.....	.....	.....	8.95	9.50*
Pittsburg, Cal. *C7*	192	210	.....	.....	213	9.60	10.15
Rankin, Pa. *A5*	173	187	.....	.....	193	8.65	9.20
So. Chicago *R3*	173	187	.....	.....	193	8.65	9.20
S. San Fran. *C6†*	.....	.....	.....	236	.....	9.60	10.15†
SparrowsPt. *B3*****	175	.....	.....	214	198	8.75	9.425
Sterling, Ill. *N4*****	175	192	172	214	198	8.75	9.425
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.30
Worcester *A5*	179	.....	.....	.....	.....	8.95	9.50
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢.
** 11-12¢ zinc.
*** .10¢ zinc.
† Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*	.....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	.....	.....
Detroit *D1*	9.05	10.50	12.70	15.70	.....
Detroit *D2*	9.05	10.50	12.70	.....	.....
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	.....	.....
Franklin Park, Ill. *T8*	9.05	10.25	12.45	15.45	18.40
Harrison, N. J. *C11*	.....	.....	12.90	16.10	19.30
Indianapolis *J3*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	.....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Pittsburgh *S7*	8.95	10.40	12.60	15.60	18.55
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *J3*	8.95	10.40	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
National Tube	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
Pittsburgh Steel	2	13	36.34	42.56	.....
	2½	12	48.94	57.31	.....
	3	12	56.51	66.18	.....
	3½	11	65.97	77.25	.....
	4	10	87.61	102.59	.....

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Machine and Carriage Bolts	Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
½" and smaller x 6" and shorter	49	54	56	57
⅝" thru 1" x longer than 6"	35	40	43	45
Rolled thread carriage bolts ½" & smaller x 6" and shorter	49	54	56	57
Lag, all diam. x 6" & shorter	49	54	56	57
Lag, all diam. longer than 6 in.	39	44½	47	48½
Plow bolts, ½" and smaller x 6" and shorter	49	54	56	57

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
¾ in. or smaller	60½
⅞ in. to 1 in. inclusive	55½
1⅛ in. to 1½ in. inclusive	58½
1⅝ in. and larger	53½

C. P. Hex, reg. & hvy.

¾ in. and smaller	60½
⅞ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½

Hot Galv. Hex Nuts (All Types)

¾ in. and smaller	46½

Semi-finished Hex Nuts

⅝ in. or smaller	60½
¾ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½

(Add 25 pct for broken case or keg quantities)

Finished

⅞ in. and smaller	63

Rivets

	Base per 100 lb
½ in. and larger	$12.25
	Pct. Off List
7/16 in. and smaller	19

Cap Screws

	Discount (Packages) *Full Finished H. C. Heat Treat*	
New std. hex head, packaged		
⅝" diam. and smaller x 6" and shorter	40	26
¾", ⅞", and 1" diam. x 6" and shorter	22	3
⅝" diam. and smaller x longer than 6"	8	+13
¾", ⅞", and 1" diam. x longer than 6"	+ 6	+32
	C-1018 Steel Full-Finished Cartons	Bulk
¼" through ⅝" dia. x 6" and shorter	58	49
¾" through 1" dia. x 6" and shorter	45	33

Minimum quantity—¼" through ⅝" diam., 15,000 pieces; 1/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

Plain Finish	Quantity	Discount Mach. Screws	Stove Bolts
Cartons		19	32
Bulk			
To ¼" diam. incl.	25,000-200,000	9	54
5/16 to ½" diam. incl.	25,000-200,000	9	54
All diam. over 3" long	5,000-100,000	—	54

Machine Screws & Stove Bolt Nuts

	Quantity	Discount Hex	Square
In Cartons		16	19
In Bulk			
⅜" diam. & smaller	15,000-100,000	7	9

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.7
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	43.50
Electrodeposited	33.25
Brass, 80-20, ball anodes, 2000 lb or more	44.00
Zinc, ball anodes, 2000 lb lots (for elliptical add 1¢ per lb)	16.50
Nickel, 99 pct plus, rolled carbon, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.70
Tin, ball anodes and elliptical $1.13 per lb.	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	74.70
Copper sulphate, 100 lb bags, per cwt.	24.35
Nickel salts, single, 100 lb bags	40.50
Nickel chloride, freight allowed, 300 lb	48.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	23.05
(Philadelphia price 23.10)	
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum N. Y.	48.00
Chromic acid, flake type, 10,000 lb or more	31.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots for minus 100 mesh

Swedish sponge iron, del. East of Miss. River, ocean bags, 23,000 lb. and over	10.5¢
F.O.B. Riverton or Camden, New Jersey, freight allowed west of Miss. River	9.5¢
Domestic sponge iron, 98+% Fe, 23,000 lb. and over del'd East of Miss. River	10.5¢
F.O.B. Riverton, New Jersey, West of Miss. River	9.5¢
Canadian sponge iron, del'd in East, carloads	10.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	27.0¢
Carbonyl iron size 3 to 20 micron, 98%, 99.8+% Fe	88.0¢ to $2.85
Aluminum, freight allowed	38.00¢
Brass, 10 ton lots	31.1¢ to 47.1¢
Copper, electrolytic	41.50¢
Copper, reduced	40.3¢ to 48.8¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99.85% min. Fe. 03 max. Del'd	$5.00
Lead	21.50¢ lb, f.o.b. plant
Manganese f.o.b. Extron, Pa.	46.0¢
Molybdenum, 99%	$2.60 to $3.95
Nickel, chemically precipitated	$1.05
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed #80	$1.13
Silicon	43.50¢
Solder powder	13¢ plus met. value
Stainless steel, 302	$1.02
Stainless steel, 316	$1.30
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$3.75 (nominal)
Zinc, 5000 lb & over	17.5¢ to 30.7¢

WAREHOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery† Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.64	8.97	9.05	9.01	10.68				
Baltimore	$.10	8.38	8.98	9.71	8.86	8.76	9.29	9.16	11.44*	16.18	15.18	19.73	18.98
Birmingham	.15	8.18	9.45	10.15	8.23	8.56	8.64	8.60	10.57				
Boston	.10	9.48	10.54	11.55	9.52	9.82	9.73	9.83	13.00	15.79	15.38	19.89	19.18
Buffalo	.15	8.49	9.15	11.22	8.65	9.05	9.05	8.95	11.05*	16.34	15.15	19.01	18.95
Chicago	.15	8.35	9.60	10.15	8.38	8.71	8.79	8.75	8.95	15.80	14.80	19.35	18.60
Cincinnati	.15	8.49	9.65	10.20	8.69	9.08	9.33	9.07	9.46	15.61	15.11	18.96	18.91
Cleveland	.15	8.33	9.60	10.10	8.48	8.94	9.16	8.84	10.95*	15.89	14.89	19.44	18.96
Denver	.20	9.70	11.30	12.49	9.80	9.70	9.80	9.98	10.65				17.60
Detroit	.15	8.58	9.85	10.50	8.73	9.06	9.33	9.05	9.30	15.46	15.06	18.81	18.86
Houston		8.45	9.75		8.60	9.05	8.60	8.55	11.10	16.20		19.30	19.05
Kansas City	.20	9.02	10.27	10.07	9.05	9.38	9.46	9.42	9.87	20.02	15.47	20.02	19.27
Los Angeles	.10	7.85**	10.85	11.75	7.90	7.90	7.95	7.90	13.35*	17.05	16.10	21.05	20.35
Memphis	.15	8.55	9.80		8.60	8.93	9.01	8.97	12.11*				
Milwaukee	.15	8.48	9.73	10.28	8.51	8.84	9.00	8.88	9.18	15.43	14.93	18.78	18.73
New York	.10	8.97	10.23	10.66	9.41	9.53	9.45	9.67	12.86*	15.82	15.19	18.42	18.99
Norfolk	.20	8.00			8.40	8.35	8.70	8.45	10.70				
Philadelphia	.10	8.10	9.00	9.97	8.79	8.87	8.60	8.75	11.61*	15.61	15.11	18.96	18.91
Pittsburgh	.15	8.33	9.60	10.50	8.48	8.71	8.79	8.75	10.95*	15.80	14.80	19.35	18.60
Portland		8.50	11.20	11.55	9.05	8.30†	8.65	8.65	14.50	18.50	16.10	20.75	20.25
San Francisco	.10	9.45	10.85	11.10	9.55	9.70	9.60	9.80	13.10	17.05	16.10	21.05	20.35
Seattle		9.95	11.15	12.00	10.00	9.70	9.80	10.80	14.05	16.55	16.35	20.65	20.15
Spokane	.15	10.10	11.30	12.15	10.15	9.85	9.95	10.25	14.20		17.35	21.55	21.05
St. Louis	.15	8.69	9.94	10.51	8.74	9.08	9.25	9.12	9.56	15.66	15.16	19.01	18.96
St. Paul	.15	8.94	10.19	10.76	8.99	9.45	9.53	9.37	9.81		15.26		19.06

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** All sizes except 18 and 16 gage.
†† 10¢ zinc. ‡ Deduct for country delivery. † 3/16 in. to ½ in. * C1018—1 in. rounds.

(Effective Jan. 6, 1958)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	.....
Birmingham *R3*	62.00	62.50*	.....	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	.....
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	66.50	67.00	67.50	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	67.50	68.00	68.50	.....	.....
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Sharpsville *S3*	66.00	66.50	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	.....	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	.....
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	63.00	68.50	69.00	69.50	74.00
Youngstown *Y1*	.....	.....	66.50	67.00	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4* (Globe Dir.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $103.50; (15.51-16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.): $64.00. Add $1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.00	23.75	23.25	25.25	—	27.00	39.75	32.25	37.00	—	16.75	—	17.00
Slabs, billets	27.00	27.00	28.00	31.50	32.00	33.25	49.50	40.00	46.50	—	21.50	—	21.75
Billets, forging	—	36.50	37.25	38.00	41.00	40.50	62.25	47.09	55.75	32.00	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55.50	64.75	37.75	33.75	34.25	34.25
Plates	44.25	45.00	46.25	47.25	50.00	50.75	76.75	59.75	69.75	40.25	35.00	36.75	36.00
Sheets	48.50	49.25	51.25	52.00	—	55.50	81.50	65.50	79.25	48.25	40.25	—	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	—	55.50	81.50	65.50	79.25	48.25	40.25	—	40.75
Wire CF; Rod HR	40.00	40.75	42.00	42.75	45.50	45.25	69.25	52.50-52.75	61.50	35.75	32.00	32.50	32.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2,* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2.*

Strip, Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2,* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville, Pa., *U2;* Detroit, *M2;* Canton-Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown, *J3,* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (plus further conversion extras); *W1;* New Bedford, Mass. (.25¢ per lb higher), *R6;* Gary, *U1* (.25¢ per lb higher).

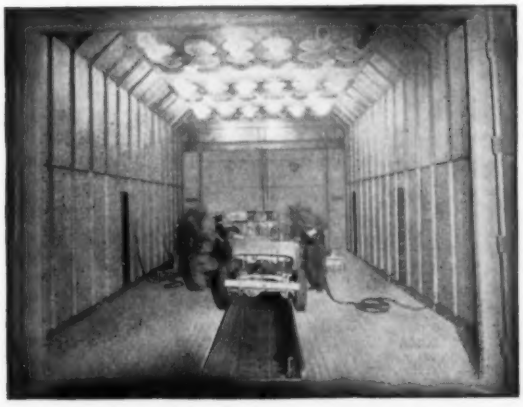
Bar: Baltimore, *A7,* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1,* Reading, Pa., *C2,* Titusville, Pa., *U2,* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5,* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2.*
Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4·* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown; *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R5;* Watervliet, *A3;* Pittsburgh, Chicago, *U1,* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1.*

(Effective Jan. 6, 1958)



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FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C....	41.00	0.50% C....	38.00
0.05% C....	39.00	1.00% C....	37.75
0.10% C....	38.50	1.50% C....	37.50
0.20% C....	38.25	2.00% C....	37.25

4.00-4.50% C, 60-70% Cr, 1-2% Si.. 28.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 27.50
0.025% C (Simplex) 36.75
8.00% max C, 50-55% Cr, 3-6% max Si 25.00
8.50% max C, 50-55% Cr, 3% max Si 25.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C $1.31
0.50% max. C 1.31
9 to 11% C, 88-91% Cr, 0.75% Fe... 1.40

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads $1.29
Ton lots 1.31
Less ton lots 1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.

Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads	27.50	14.20
Ton lots	32.75	15.65
Less ton lots	34.35	17.30

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads 25.65
Ton lots 27.95
Less ton lots 29.45

Calcium-Manganese—Silicon

Cents per lb of alloy, lump, delivered, packed.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads 24.25
Ton lots 26.15
Less ton lots 27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots 21.15
Less ton lots 22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots 17.20
Ton lots 18.70
Less ton lots 19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed 18.50
Ton lots to carload packed 19.65
Less ton lots 20.90

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.25
Johnstown, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25

Add or substract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk 14.80
Ton lots packed 17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed 45.75
Ton lots 47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads 34.00
Ton lots 36.00
250 to 1999 lb 38.00
Premium for Hydrogen - removed metal 0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 25.50

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80-85% Mn, 5.0-7.0% Si ...	28.60	31.40	32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk 12.80
Ton lots, packed 14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet 15.10
Ton lots, packed, pallets 16.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots, packed	Carloads, packed
96.75% Si, 1.25% Fe..	24.20	22.90
98% Si, 0.75% Fe	24.95	23.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk 7.70
Ton lots, packed 10.50

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si....	14.20	75% Si....	16.40
65% Si....	15.25	85% Si....	18.10
	90% Si....	19.50	

Ferrovanadium

50-55% V delivered, per pound, contained V, carloads, packed.

Openhearth 3.20
Crucible 3.30
High speed steel (Primos) 3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots..	2.40	3.30	4.55

(Effective Jan. 6, 1958)

Aisifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads ..... 10.65¢
Ton lots ..... 11.50¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.28

Ferrocolumbium, 50-50%, 2 in. x D, delivered per pound contained Cb.

Ton lots $4.90
Less ton lots 4.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Sb plus Ta $4.25

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.68

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00
10 tons to less carload $110.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $240.00

Ferrotungsten, ¼ x down packed, per pounds contained W, ton lots delivered ..... $2.60 (nominal)

Molybdic oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa. $1.41
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump ..... 18.50¢
Ton lots, packed lump ..... 20.50¢
Less ton lots ..... 21.00¢

Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5 ..... $1.38

Zirconium, per lb of alloy

35-40% f.o.b. freight allowed, carloads, packed ..... 27.25¢
12-15%, del'd lump, bulk-carloads ..... 9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B

2000 lb carload $5.50

Bortram, f.o.b. Niagara Falls.

Ton lots per pound ..... 45¢
Less ton lots, per pound ..... 50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots per pound ..... 14.00¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots... $1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B ..... .85
14 to 19% 1.20
19% min. B 1.50

Grainal, f.o.b. Bridgeville, Pa., freight, allowed, 100 lb and over

No. 1 ..... $1.05
No. 79 ..... 50¢

Manganese-Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots $1.46
Less ton lots 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15

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Let's give our doctors a chance to head off cancer in time! Form the life-saving habit of a head-to-toe health checkup once a year. For men, this should include a chest x-ray; for women, a pelvic examination.

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"ANYTHING containing IRON or STEEL"

West Expects Pickup in 2nd Quarter

Used machinery dealers in Farwest are looking beyond present slow business to hoped-for improvement in the spring.

Southern California sellers still more active than those in San Francisco area and the Pacific Northwest.

▪ West Coast used machinery dealers have a word for it: Slow. Dealers now pin their hopes on a second quarter pickup. That's when they expect aircraft and missile orders to pep up the business pace there.

Southern California dealers, however, aren't complaining nearly as much as San Francisco Bay Area and Pacific Northwest counterparts. Los Angeles men say there's good demand from makers of consumer goods. At least it's enough to offset the slowdown from the reduced pace of military business.

Not Enough New Units—Sales can be made, but the machine must be in very tip-top condition and at a reasonable price. What's being offered is mostly too old or too high priced. And the supply of tools coming on the market isn't too hot. Manufacturers are holding on to what they have until the future clears up a bit.

Sheet metal equipment, long a fast mover in southern California, is now slowing down. Light duty tools are slow. But sales are pretty good in the ¼-in.-and-above sizes. The market for small and large welders is fair.

Buyers Are Only Shortage—Used machinery dealers in the northern California area are unhappy about business for the past six months. Nothing is in short supply, they report. That is, nothing but buyers. Inquiries, while fairly active, are not converted into sales frequently enough.

Financing Difficult—Good used equipment that was bringing as much as 75 pct of new equivalents, can now be had for about 50 pct.

Pressured to name the better of the slow movers, dealers list: milling machines, drilling presses, hydraulic presses, press brakes, shears and heavy presses.

Financing now is somewhat of a problem, dealers concede. Where they formerly were willing to let out a piece of equipment on a small down payment, they no longer are. This is primarily because the probable earning power of the equipment in the hands of the poorly-financed operator is not too good. This increases the risk involved for the dealers—and in these softening times, they are less willing to take the chance.

Slow in the North—In Seattle, the market for used machinery remains slow. There's some demand for high-quality, priced-right, light equipment. Heavy items are not moving.

Despite signs that better times lie ahead, metalworking plants are putting on the brakes. And they plan to keep them on until business gets better. Citing high unemployment figures, one supplier commented: "You can't blame anybody for not buying right now; things just aren't right for it."

CONSIDER GOOD USED EQUIPMENT FIRST

BENDING ROLLS
10' x 10" Ga. Bertsch Initial Type
10' x ½" King Pyramid Type
10' x ½" Bertsch Initial Type
18' x 1" Niles Pyramid Type

BRAKE—PRESS TYPE
10' x ¼" & 12' x ¼" Hydraulic—NEW

CRANES—OVERHEAD ELECTRIC TRAVELING

3 ton P&H	56' Span 220/3/60
5 ton Cleveland	60' Span 115 Volt D.C.
5 ton Shepard Niles	70' Span 230 Volt D.C.
8 ton P&H	55' Span 220/3/60
10 ton Shepard Niles	38' Span 440/3/60
10 ton Shaw	48' Span 230 Volt D.C.
10 ton Shaw	120' Span 230 Volt D.C.
15 ton Shepard Niles	52' Span 230 Volt D.C.
15 ton Niles	75' Span 230/3/60
20 ton Shaw	28' Span 230 Volt D.C.
120 ton Shepard Niles	77' Span 220/3/60

DRAW BENCHES
8,000# Waterbury Farrel Single Draw 20 Ft. Length of Draw
10,000# Aetna Standard Single Draw 44 Ft. Length of Draw

FORGING MACHINES
1" to 5" Acme, Ajax, National

FURNACE—MELTING
15 ton Heroult Top Charge, 12' Shell Complete with Transformers

HAMMERS—BOARD DROP—STEAM DROP—STEAM FORGING
800 lb. to 12,000 lb. incl.

HEADERS
#250C Manville Solid Die Single Stroke
#14 Waterbury Farrel DSOD Cap. ⅝" x 6"

LEVELLERS—ROLLER
27" Torrington, 19 Rolls 1 31/32", dia.
66" Aetna 17 Rolls 4⅝" dia.

PLANERS
36" x 36" x 10' Cincinnati
48" x 48" x 16' Niles-Bement-Pond
72" x 72" x 16' Detrick & Harvey Four Head

PRESSES—HYDRAULIC
500 ton HPM Fastraverse, Bed 36" x 36"
1500 ton Bliss 15" Stroke, Bed 49" x 48"
1500 ton Mesta Steam Hydr. Forging Press
2000 ton Bliss 18" Stroke Bed Area 54" x 55"
4500 Baldwin-Lima-Hamilton Hydr. Forging Press

PRESSES—STRAIGHT SIDE
180 ton Hamilton #847, 12" Str. 85½" Bet. Ups.
200 ton Clearing F1200-42, Stroke 30", Bed 44"x38"
250 ton Bliss #88 12" Str. Bed 29" x 29"
250 ton Bliss SI 7½" Str. Blstr. 33" x 39"

PUNCH & SHEAR COMBINATIONS
Cleveland Style EF, Arch Jaw Capy 1¼" x 1"
Cleveland Style G Single End. 60" Throat
Cleveland Style W, 60" Throat. Architectural Jaw
#7 Kling, 72" Throat, With Thomas Duplicator

ROLLING MILLS
6" x 5" Tortington Wire Flattening Mill Line
8" x 10" Schmitz Single Stand Two High
10" x 14" Single Stand Two High
10" x 16" Single Stand Two High
12" x 12" Single Stand Two High
12" x 16" Single Stand Two High
16" x 24" Single Stand Two High
20" x 36" Single Stand Two High

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14 stand Yoder, 2½" Shaft dia. 30" bet. housings

ROLLS—PLATE STRAIGHTENING
108" Bertsch, Seven Rolls 9" Dia.
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No. 4 Mesta RH LK, Capacity 2" x 12"

SHEARS—GATE
6' x 1" Hilles & Jones #6
12' x ⅜" Niagara Model 1212, NEW 1951

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42" Bliss Up-Cut Shear, Capacity .125" Max. With Hump & Run-out Tables
53" x ⅝" Heavy Duty Shear Line
60 x 7 Ga. Shear Line
96" x 14 Ga. Cleveland Shear Line

SHEARS—SQUARING
6' x 10 Ga. Niagara No. 672
10' x ¼" Cincinnati #1810
10' x ⅜" Cincinnati #2510

SHEAR—ANGLE
6 x 6 x ⅝" Hilles & Jones

SLITTER
36" Paxson Slitting Line

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No. 3 Medart 3 Roll, Capacity to 4½" Tubing
Torrington 12-Roll Capy. 1⅝" Hex., Sq., Etc.
No. OA Medart 2-Roll, Capacity ⅛" to 1" Bars
No. O Medart 2 rolls, Capacity to 1¼" dia. Bars

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#6½A Fen, Capacity 3⅜" Tube, 1⅛" Solid, 16" Die Length Hydraulic Feed, LATE

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Ransohoff Continuous Tumbling Mill, Capacity Approx. 100 cu ft. of work per hr. LATE

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Pandjiris Welding Positioner 22 x 20, Hoist Stroke 20'10", Boom Stroke 20'6" LATE

WIRE MACHINERY
New England Butt Co. 4-Bobbin Planetary cablers Model X-30A, Robbin Size 16" x 19⅛"
Vaughn Wire Drawing Machine, 4 Blocks 22" Dia. Complete elecl. equip. for each block

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180 ton No. 27 Williams and White bulldozer
6" capacity No. 401 Campbell "Cutamatic" abrasive cut-off
2850 CFM Worthington 650 HP synchronous motor electric drive compressor
20" swing No. 217 Baker Brothers box column heavy duty upright drill
4' arm 9" column Cincinnati Bickford super service radial
24" swing No. 3 Allen 3 spindle production drill
No. 15½ Foote Burt vertical hydraulic feed driver for a multiple head (2)
20" x 72" Landis type D heavy duty plain hydraulic cylindrical grinder
53" No. 24A Gardner vertical spindle horizontal disc grinder, 15 HP, multiple vee belt dr.
8" x 24" No. 35 Abrasive surface grinder
300 lb. No. 3C Chambersburg pneumatic forging hammer
28 Nazel forging hammer
4" bar Universal "Tri-Way" horizontal boring, milling and drilling machine
30" x 30" x 8' Cincinnati Hypro two rail, one right hand side head, dial feed planer
600 ton No. 664 Toledo tierod frame knuckle joint coining press
600 ton Elmes cast steel high speed downward acting hydraulic press
500 ton Baldwin Southwark high speed hydraulic vertical downward working press
800 ton Model 2E48-800 Hamilton straight side single crank air clutch press
750 ton No. 3 National all steel Maxipress
96" x ⅝" capacity Beatty No. 29 power squaring shear, late

Ask for latest stock list

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2000# Chambersburg Pneumatic Forging Hammer, Late Type, Serial 20CH392L7.
2500 lb. Model E Chambersburg Steam Drop Hammer, New 1944
6½" Square Alligator Shear; clutch operated; United Engineering & Foundry.
WHEELABRATOR, American; 36" x 42", skip loader hoist; dust arrester.
Lindberg Endothermic Atmospheric Generator; 750 CFH, output 2200 deg. F.
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3—2-ton Denison Auto. Hopper Feed & Index Table Hydr. Multipress
6' x 10 ga. Cincinnati Squaring Shear
¼" x 8' Pexto Gate Shear; 20" throat
4" National High Duty Upsetting & Forging Machine, air clutch, also one with regular clutch, also 1" 2", 3"
Williams White Bulldozers from 5-ton to 300-ton
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1450 KW double armature Whse. Generator, 600 VDC, 900 R.P.M. separate excited fields with 2250 HP, syn. motor, 2300/4000 volt, 3 phase, 60 cycle.

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Qu.	KW	Make	RPM	D.C. Volts	A.C. Volts
5	1500	Al. Ch.	514	350/700	13800/6900/4160
5	1500	G.E.	514	250	2300/4000
1	1450	Whse.	900	600	2300/4000
8	1250	Al. Ch.	720	600	2300/4000
1	850	G.E.	720	340/750	2300
1	725	Whse.	900	600	2300/4000
1	500	Cr. Wh.	720	600	2300/440
1	500	G.E.	900	250	2300
4	300	Whse.	1200	125/250	2300
1	300 (3-unit)	Al. Ch.	1200	250/300	2300
2	200	Whse.	1200	125/250	2300/440
2	150	Rel.	1200	125	2300/440
1	150	Whse.	1200	125/250	2300/440
1	150	G.E.	1200	250	4600/2300
1	100	Whse.	720	125/250	220
1	75	Whse.	1200	125/250	2300

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Quick Work Rotary Shear, ½" plate cap., 48" throat m.d.

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1—28" x 40" HOT STRIP MILL, 2-high, reversing with 2000 HP D.C. motor, etc.
2—28" 3-HIGH ROLL STANDS with inlet, outlet and intermediate tables. Will produce 4" sq. billets from 8" sq. blooms in 6 passes. Includes bloom shear.
1—28" REVERSING BREAKDOWN MILL.
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1—28" PINION STAND, 2-high, modern design.
1—16" x 22" COLD MILL, 2-high.
1—14" x 18" COLD MILL, 2-high.
1—10" x 14" COLD MILL, 2-high.
1—CLUSTER MILL, 4-stands, each with 2 work rolls 3¼" x 7" and 4 back-up rolls 5" x 6".
1—10" x 10" 2-HIGH COLD MILL. Combination pinion stand and gear, extra forged steel rolls.
1—16" BAR MILL, 3-high, 4-stands, with speed reducer.
1—10" ROD MILL.
1—9" BAR MILL, 3-high.
1—REEL, 11" face x 17½" dia.
1—UNCOILER, cone type, 60" max. width coils.
1—RECOILER for 80" wide strip.
1—1500 TON STEAM HYDRAULIC FORGING PRESS.
1—34" x 192" ROLL GRINDER.
1—44" ROLL LATHE, enclosed headstock, tailstock, piano rest, 20 HP 500/1500 RPM 230 volts, D.C. motor and controls.
2—65-TON ELECTRIC MELTING FURNACES, TOP CHARGE, with all electrical and mechanical equipment including 15,000 KVA and 13,333 KVA transformers.
1—ROLLER LEVELLER McKay, rolls 80" face & 5¼" dia. with gear box and universal spindles.
1—STRETCHER LEVELLER for sheets, 500,000 lb.
2—KANE & ROACH BAR AND ANGLE STRAIGHTENERS, Size #4, cap. 3" x 3" x ⅜" angles, 3½" channels and 2" bars.
1—STRAIGHTENER, MEDART NO. 0, for rounds ¼" to 1½" dia.
1—STRAIGHTENER, MEDART NO. 04A, for rounds ⅛" to 1" dia.
2—UNITED HOT SAWS, 50", sliding frame.
1—UNITED #4 BAR SHEAR vertical open side.
1—156" x ¼" SHEET SQUARING SHEAR.
1—SLITTING SHEAR FOR SHEETS, Mesta 92".
1—HALLDEN FLYING SHEAR LINE, capacity 36" wide x 20 to 34 gauge x 15" to 144" long.
1—Tandem SLITTING AND CUT-TO-LENGTH LINE, heavy duty, max. opening for 38" wide.
1—MORGAN INGOT STRIPPER CRANE, 50' span, 200 tons capacity, 230 volts D.C.
1—ALLIANCE LADLE CRANE, 4 girders, 30 ton main hoist, 25 ton auxiliary, 55'5" span, 42' lift.
2—90-ton Treadwell HOT METAL TRANSFER CARS.
3—Blaw-Knox SLAG LADLE TRANSFER CARS.
1—CORRUGATING MACHINE, Stamco, for 12' wide sheets, including several sets of removable dies.
1—DRAWBENCH, Mesta, oil-hydraulic, for 3 strands of bars 20' long
1—WIRE DRAWING MACHINE, Aetna-Standard, 16" block, 5-unit.
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2—60-TON CAPACITY HOLDING FURNACES, electric, each with 7500 KVA transformer.
2—PACK FURNACES for hot sheet mills 62" x 60' double chamber.
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1—3000 HP GEAR DRIVE, ratio 500 to 73.7 RPM.
1—3000 HP GEAR DRIVE, ratio 500 to 95.8 RPM.
1—1200 HP GEAR DRIVE, 353 to 94.6 RPM, 3.73 to 1 ratio.
2—35 HP SPEED REDUCERS, Falk 21 to 1.
1—3500 HP MOTOR, 11000 volts, 3 phase, 60 cycle, 514 RPM.
1—1200 HP MOTOR, 2200 volts, 3 phase, 60 cycle, 353 RPM.
1—50 HP MOTOR, G.E. frame MD-610-AE, 230 volts, 500 RPM.

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BROS 250 HP Type S Water Tube Boiler with Todd Rotary Burner—new approx. 1952.
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DENTON 48" x 38" x 84" Oil Fired Furnace—new, approx. 19'6.
3-CHAMBERSBURG 2000# Model F Board Drop Hammers—Motor Drive.
MASSILLON 1500#-2000#-2500# Steam Drop Hammers.
NILES 800# Steam Forging Hammer.
LEBLOND 19" x 44" centers Engine Lathe.
WALCOTT 24" x 60" centers Engine Lathe.
KEARNEY & TRECKER #2B Plain Horizontal Milling Machine.
AMERICAN 48" x 48" x 10' double housing Planer.
NILES 36" x 36" x 14' double housing Planer.
6-BLISS #56, #65 and #73½ Straight Side Trimming Presses.
2-MASSILLON #5 Straight Side Trimming Presses.

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Qu.	H.P.	Make	Type	Volts	Speed
2	1750	G.E.	M-579BS	4800	1800
1	1500	G.E.	MT	6600	1187
1	1100	F.M.	GVZK, B.B.	4800	1800
1	800	G.E.	MT	2300	292
1	750	G.E.	MT-573	2200	1190
1	700	A.C.		2300	500
1	500	Whse.	CW	550	350
1	400	Whse.	CW	440	514
1	350	Cr.Wh.	Size 71	208/416	1765
1	250	G.E.	IM-17A	440/2200	720
1	250	G.E.	MT-492Y	4000	257
1	250	Cr.Wh.	Size 290	2300	350
1	250	Al.Ch.		550	600
1	200	G.E.	IE13 B-M	220/440	1760
1	200	G.E.	MT-557Y	220/440	1760
1	200	Cr.Wh.	290B	440	505
1	200	G.E.	IM	440	435
1	200	G.E.	I-17AM	2300	435
1	200	G.E.	IM	2300	580
1	170 (unused)	Whse.	CW	2300	435
1	125	A.C.		440	865
1	125	Al.Ch.		440	720
1	100	G.E.	IM-16	2300	435
1	100	G.E.	IM	440	600
4	100	A.C.	ANY	440	695

SQUIRREL CAGE

1	800	G.E.	KT-573	2200	1180
1	650	G.E.	FT-579BY	440	3570
3	500	Whse.	CS-1516	2000	500
9	470	Whse.	CS-1420	2300/4150	954
1	400	G.E.	IK	2200	560
1	300	G.E.	KT-556A	2200	1775
1	200	G.E.	IK-17	440	580
9	200	G.E.	KT-557	440	1800
1	150/75	G.E.	IK	440	900/450
1	150	Whse.	CS8568	440	880
1	150	Whse.	CS	440	580

SYNCHRONOUS

Qu.	H.P.	Make	Type	Volts	RPM
1	7000	G.E.	ATI	2200/6600	600
1	4350	C.W.	3501SL	4000/6900/13800	514
1	2850	Whse.	Sp.f	2300/4600	514
1	2800	Whse.	Sp.f	2200	720
1	2000	Whse.		2200	100
2	1750	G.E.	ATI	2300	3600
1	735	G.E.	ATI	2200/13000	600
1	450	Whse.		2200	198.5
1	385	G.E.	ATI	440	1800
1	285	G.E.	ATI	440	1800
1	100	G.E.	TS-7556	220/440	900

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1—1 yd. Northwest 41 Diesel Crane.
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1—44 ton G.E. Diesel Electric Locomotive.
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200 Ton Steel Frame Double Geared
12" Stroke Slide Area 24" x 36"
Friction Clutch. 1951 Machine

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THREADS AND CUTS PIPE 8" TO 18", NEW 1953, EXCELLENT CONDITION.
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1—4-High Cold Mill, 12" x 5½" x 5½" x 12" x 10½" face, complete with reels, electrical, lubrication, etc.
1—Mesta Cold Rolling Mill, 49" x 18" x 18" x 49" x 42" face, 4-high with motors and controls.
2—Hot Metal Transfer Cars, 90 ton capacity, new condition.
2—10 ton Bessemer Converters consisting of stands, driving mechanism, shell, base plate, trunnion bands, spare bottoms, wind boxes, hydraulic jack cars, bottom oven cars, air valves, slag cars, slag boxes, wet pan, Coleman coke fired ovens and all accessories.
4—Whiting 132" dia. Cupolas, height 39' 6" with hot blasts and equipment, displacement blowers, skip hoists and bridges, skip cars, etc.
1—Rotary Lime Kiln, 6' dia. x 70' long, complete with trunnions, rollers, speed reducer, motor and control.
1—6,000# Brosius Charging Buggy, gasoline engine driven, solid rubber tires
1—20" x 96" Landis Roll Grinder, automatic crowning, 230 volt motors.
1—24" x 22' long Roll Lathe Parts consisting of Head stock, bed, Motor, no control. All other parts not included.
1—Lee Wilson electric Annealing furnace, 8' 6" x 20' 6" high outside, 5' 6" x 16' 10" inside size, inner covers, 3 bases, convection fan, gas atmosphere, L & N Contros.
1—Chicago pneumatic Air Compressor, 14" x 12", 430 CFM, motor, control, lubricator, 125 PSI.
1—1700 CFM Chicago Pneumatic Air Compressor, 125 PSI, 23" and 13" x 16", motor driven 300 HP motor and control, overhauled in 1951.
1—Steel Frame Building, 168' wide x 596' long, consisting of 3 aisles as follows: 1 aisle 78' wide with 80 ton crane runway full length; 1 aisle 31½' wide with 10 ton crane runway half length; 1 aisle 58½' wide no crane runway, including one 40 ton crane and one 10 ton crane; stripped for dismantling.

WANTED

1—4 high cold rolling mill, 2" dia. work rolls x 6" wide, Steckel mill type.
1—40" to 48" Slitter or complete slitting line.
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